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RESOURCE DISTRIBUTION IN TEXAS SCHOOL DISTRICTS: AN EXAMINATION OF EXPENDITURE ALLOCATION PATTERNS IN TWO MAJOR URBAN SCHOOL DISTRICTS WITH DIVERGING ENROLLMENT

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by

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Dedication

To my mother, Alice W. Barajas, who gave me the freedom as a young man to explore and question things I saw. While this may have driven you crazy, they were the very tools I needed to complete this study.

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This journey has been long, and I could not have completed it without the help and guidance of so many. First and foremost is my committee. Mike Thomas showed patience while I took time away from the study to gather my thoughts and decide if I still had it in me to finish. Jay Scribner's kind words to me when I started this journey in 2001 helped me decide that I did have it in me to finish. For that I am forever grateful. Charles Clark's keen observations of my research helped me frame the research in a way that, in the end, made it better. Richard Schott helped me go one step further in my research by asking me to explore "beyond the numbers". I am grateful he agreed to serve on the committee. Don Hendrix encouraged me when I was a young school district business manager to seek out the doctorate and take a bigger role in positively affecting the lives of Texas schoolchildren. Don, I did and will.

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RESOURCE DISTRIBUTION IN TEXAS SCHOOL DISTRICTS: AN EXAMINATION OF EXPENDITURE ALLOCATION PATTERNS IN TWO MAJOR URBAN SCHOOL DISTRICTS WITH DIVERGING ENROLLMENT

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This study examines expenditure allocation patterns of two Texas school districts that experienced diverging enrollments in relation to each other over eight school years. Expenditure allocations to general and specific operational areas and various student groups are examined in relation to changes in enrollment. In addition, how expenditures per student changed as a result of increasing and decreasing enrollment is explored. Ratio analysis, based on the percentage contribution to total General Fund expenditures, determined the changes in expenditure allocations to operational areas and student groups. These changes are compared to changes in enrollment. Expenditure per student calculations are made using inflation-adjusted data and regression analysis, employing *Pearson's r*, determines how well enrollment changes explain changes in expenditures per student. Results indicate that increasing and decreasing enrollments had little effect

on how the districts allocated general and specific resources as no significant relationships were noted. Resources allocated to basic instructional services, which served the largest number of students, were indicative of the direction of enrollment suggesting that students in districts with increasing enrollment garner more resources. Total expenditures per student showed no correlation in the decreasing enrollment district and a marginally strong positive relationship in the increasing enrollment district. The empirical findings did not support the inverse relationship between enrollment and expenditures per student referenced in the literature. The findings suggest that in addition to enrollment, there are other factors at work that dictate how resources are allocated. In addition to determining these other factors, incorporating the district's federal budgets into the analysis to determine if the inclusion of all available resources would significantly alter the findings of how each district allocated resources as a result of changes in enrollment is warranted.

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CHAPTER ONE

Introduction

Data from the U.S. Department of Education's National Center for Education Statistics (NCES) provide a telling story of the increase in the number of students enrolled in America's public schools. From 1985 to 2005, the number of students enrolled in public elementary and secondary schools increased by 22%, with an estimated enrollment of 48.3 million students in 2005 (Snyder, Tan & Hoffman, 2006). The NCES estimates that "overall, school enrollment is projected to set new records every year from 2006 until at least 2014…"(p. 7) bringing total public elementary and secondary student enrollment in 2014 to an estimated 50 million. This increase in the number of students parallels the increase in the population of the United States. According to the latest U.S. census, the population of the United States reached 281 million in the year 2000, a 13% increase over the 1990 census figure of 248 million (Hobbs & Stoops, 2002).

The census data also indicate that where people choose to live has changed as well. Rural areas accounted for 24% of the population in 1990, dropping to 20% in the 2000 census. According to Hobbs and Stoops, suburban areas, not central cities, accounted for the growth in metropolitan areas. This population shift means more people have congregated around large cities and, as such, the increase in the number of students attending schools located in major metropolitan areas has also increased. Hobbs and Stoop noted that by the year 2000, "half of the U.S. population lived in suburban areas" (p. 1). However, with cities sprawling in all directions, the demarcation line

between what is urban and suburban becomes blurred, often loosely defined by various governmental units or simply by those who occupy either area. The shift in where people live determines where school age children attend school, giving rise to the notion of "urban" and "suburban" schools. Thus, in large cities that encompass both urban and suburban districts, one would expect that student enrollment would show a general shift away from urban districts and into suburban districts. In fact, data from the NCES indicate an increase in suburban school enrollment and a decrease in major urban school enrollment. According to data published in the NCES's 1998 Digest of Education Statistics, there were 8.3 million students enrolled in "large city" schools and 13.5 million enrolled in what the NCES terms "urban fringe of a large city" (Snyder, Tan & Hoffman, 1999). By the fall of 2003, the number of enrolled students in schools in large city districts had dropped to 7.6 million while school enrollment in urban fringe districts increased to 13.8 million (Snyder et al., 2006).

The state of Texas, with a 2000 census population of 20.8 million, mirrors this nationwide trend. Perry and Mackun (2001) note that "in Texas…the Dallas, Houston, Austin, and San Antonio metropolitan areas show up as pockets of fast population growth, while most of the nonmetropolitan counties in the state recorded either slow growth or population decline" (p.5). While on the surface the difference between urban and suburban districts seems to be the number of enrolled students, other underlying differences, such as costs per student, academic achievement and expenditure allocation patterns, begin to manifest themselves.

Expenditure allocation patterns change when there are changes in enrollment. For example, districts that lose students may see a reduction in resources allocated to instruction while resources to administrative and support service remain the same. Interestingly, a review of the literature (e.g., Bowles & Bosworth, 2002; Anderson and Mark, 1985) reveals that districts that decrease in student enrollment have a tendency to spend more per pupil as both instructional and administrative expenditures either increase or remain the same. Conversely, schools that increase in student enrollment would shift resources into instructional related areas and spend less, proportionately, on administrative and support service expenditures. It follows then that school districts with increasing enrollment, and assuming instructional costs are not increased at an exorbitant rate, would spend less per student. A review of the literature (e.g., Cavin, Murnane & Brown, 1985) indicates this phenomenon does take place. The study that follows makes the assumption that the two school districts in the study will exhibit these cost-per-pupil characteristics. While these assumptions are a priori, it is obvious that expenditure allocation patterns will change, perhaps even altering what school districts spend per pupil, when the organization undergoes a change in enrollment. How they change vis-à-vis changes in enrollment is the thrust of this study.

This study examines the expenditure allocation patterns exhibited by two large Texas school districts over an eight-year period. In the 1997-98 school year, these districts, both located in the same major metropolitan area, had essentially the same enrollment. That enrollment figure, approximately 60,000 students, represented a crossroads for these districts as it is the point where the two districts began to diverge in

enrollment. From 1990 to 1997, one district's enrollment remained fairly stable at approximately 60,000 students. The other district's enrollment in 1990 was approximately 50,000 but was increasing every year. Then, in 1998, the districts were essentially equal in the number of students enrolled. However, since 1998, these two school districts have diverged in student enrollment and in the 2004-05 school year had a difference of approximately 18,000 students. This analysis begins with data from the 1997-98 school year and tracks the changes in resource allocations through the 2004-05 school year. As noted above, the assumption is that these two school districts will exhibit the same expenditure allocation and expenditures per pupil patterns noted in numerous research studies on the impact of changing enrollment on expenditure allocations and costs per student, namely that school districts tend to spend less per student as they increase in enrollment and more per student as they lose enrollment. In conjunction with these assumed expenditure patterns is the assumption that as schools gain enrollment, they spend proportionately more on instructional expenditures. Conversely, as districts lose enrollment they tend to spend proportionately less on instruction and more on administrative expenditures.

Background

All across the nation, the cost of K-12 public education is an issue that is fiercely debated. Whether the debate focuses on the enormous cost of that education, the seemingly inadequate funding mechanisms employed by many states, or whether the resource inputs produce a measurable output in the way of increased student achievement, the economics of K-12 public education is at the forefront of many state

and federal legislative concerns. It is also no coincidence that this topic is much studied by educational finance researchers. The U.S. Department of Education reported that in fiscal year 2003, total expenditures nationwide for public education amounted to $511 billion, roughly 4.7% of the nation's gross domestic product (Synder et al., 2006) making public education a "big business" in the United States. So big, in fact, that the amount spent for public education in 2003 was greater than the economies of Egypt and Greece.

While these enormous sums of money represent spending at the macro level, most of the research that has been conducted to look for a relationship between what is spent and what is produced has been done at either the district, school or classroom level. Education researchers such as Hanushek (1989) argue that there does not exist any relationship between education spending and education output. In other words, no matter how it is measured, spending more on instruction does not lead to increases in student achievement. Other researchers suggest that money does make a difference in the academic achievement of students (Howley and Howley, 2004; Hedges, Laine & Greenwald, 1994) and argue that more money is needed if we are to produce higher levels of student achievement. Odden and Archibald (2001) take the middle road and argue that what schools need to do is make better use of existing resources, giving rise to the notion that it is a proper allocation of resources, not an increase of resources, that ultimately raises student achievement.

This concept of reallocating existing resources to increase student achievement ends with attaining that increase in achievement and begins with an analysis of how

resources are allocated in the first place. Once it is determined how resources are allocated, adjustments can be made to determine what allocation mix may produce an increase in student achievement. While allocation patterns can be easily altered in a static environment, especially one where student enrollment is static and homogeneous, variations in resource allocation patterns will occur naturally as the enrollment of the school and district changes, thereby potentially masking what caused changes in student achievement. For instance, larger schools may spend a larger percentage of the budget on instruction partly because of the fact that non-instructional costs, such as administrative and support service, remain stable up to a certain point. However, Easton (1993) found that larger schools tend to spend less per pupil than smaller schools. Smaller schools and districts, needing roughly the same amount of administrative and support service "overhead", have to spend a greater portion of their available resources on non-instructional expenditures such as administration (Anderson & Mark, 1985). They also show a tendency to spend more per pupil (Easton, 1993). Cavin et al., (1985) found in their study that the increase in expenditures per pupil were the result of districts losing enrollment and not being able to react quickly enough to reduce teaching staff, thus spreading costs over fewer students. Interestingly, some research studies (Driscoll, Halcoussis & Svorny, 2003; Kazal-Thresher, 1993) show that smaller districts, schools, and classes tend to produce higher student achievement, though the link between spending and student achievement becomes intractable, as costs such as transportation and maintenance, figured into the cost per student, show no affect on student achievement. While most of these studies used size as the metric and analyzed total costs

per student, little, if any, attention was paid to analyzing the entire allocation pattern of the school district and how the school district changed expenditure allocation patterns when changes in enrollment occurred.

Diverging Enrollments as a Case for Study

With so much attention focused on the cost of education and the results obtained for that cost, one factor that becomes important in this analysis is how schools allocate their resources. Whether one subscribes to the notion that resources are the key to increases in student achievement or its antithesis that resources have no relationship to student achievement, central to either notion is how schools allocate their available resources. Concomitant with that issue is how schools distribute those available resources in light of exogenous circumstances such as changing student enrollment.

We have already seen how the shift in population from urban to suburban areas also translates into shifting enrollment patterns in schools. Recent data from the Texas Education Agency's (TEA) report *Enrollment in Texas Public Schools 2005-06* (TEA, 2007) revealed that student enrollment for both major suburban districts and what the TEA calls "other central city suburban districts" grew at a faster rate than major urban districts. The major urban districts as defined by the TEA are Austin ISD, Dallas ISD, El Paso ISD, Fort Worth ISD, Houston ISD, San Antonio ISD, Northside ISD in Bexar County, Arlington ISD and Ysleta ISD. The growth rate for the major urban districts was 20.3% as compared to 35.3% for major suburban and 64.9% for other central city suburban districts. While major urban districts as a group were growing, not all in the group were experiencing growth in student enrollment. Both districts used in

this study come from the major urban category and represent districts with growing and declining student enrollment. While there are a multitude of comparisons that can be made between these two types of districts, the comparison that is central to this study is how the spending patterns have changed between these two school districts. This is important because the districts have experienced diverging enrollments in relation to each other, are both defined by the TEA as major urban, and are located in the same major city, drawing from the same population.

Problem Delineation

While numerous significant studies have been conducted on how cost allocation impacts student achievement, there is a paucity of research that seeks to determine simply how school districts shift allocations of resources when they undergo changes in enrollment. Many studies have used size as a variable (Monk, 1984; Anderson & Mark, 1985; Cavin et al., 1985), but the majority of these studies used size, whether class, school, or district, as an independent variable to determine how that variable affected student achievement (Driscoll et al., 2003; Lamdin, 1995; Walberg & Fowler, 1987; Childs & Shakeshaft, 1986). In other words, does the size of a school help or hinder student achievement? This seems to be the zeitgeist of educational research based on the number of studies conducted in this area. Far fewer studies have used size as a determinant of how schools allocate resources. This study will examine how two Texas school districts, both major urban as defined by the TEA, located in the same county in the same major Texas city, have altered their allocation of resources as enrollment changed over eight successive school years. It is important to note that in the school year

1997-98, these school districts differed in enrollment by a mere 1,029 students, with both districts enrolling approximately 60,000 students. However, since then and through the school year 2004-05, their enrollments diverged making the difference in enrollment approximately 18,000 students. This study will seek to answer the following research questions:

1. How did resource allocation patterns in these two school districts change by major functional areas as student enrollment changed?
2. What specific functional areas in these two school districts gained or lost resources as student enrollment changed?
3. What categories of students in these two school districts gained or lost resources as student enrollment changed?
4. It is expected that there will be an inverse relationship between student enrollment and expenditure per student. As such, this study will seek to determine, for each school district, the relationship between the effects of changing student enrollment and total expenditures per student.

Definition of Terms

Major Urban School District

According to the Texas Education Agency, a district is major urban if "it is located in a county with a population of at least 700,000" and "its enrollment is the largest in the county or at least 75 percent of the largest district enrollment in the county; and at least 35 percent of enrolled students are economically disadvantaged" (TEA, 2007, p.46).

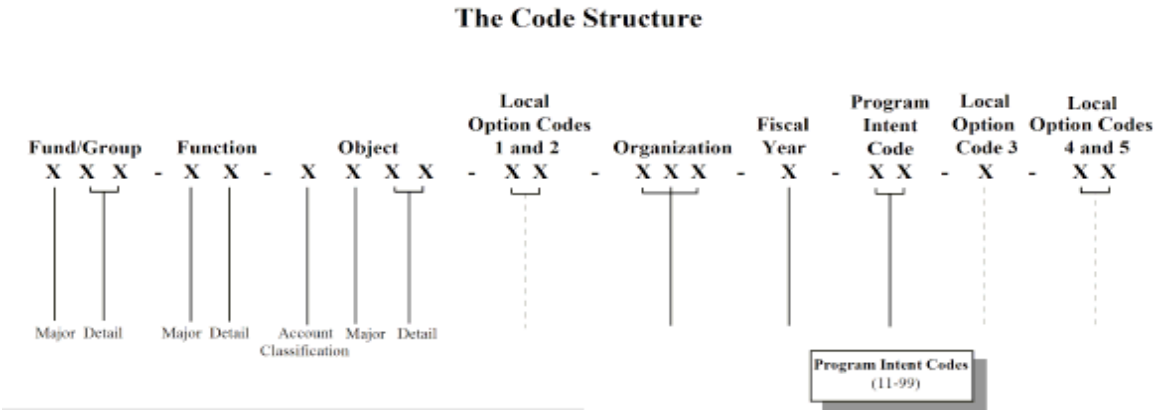
General Fund

The largest of a school district's funds used to track resources derived primarily through state and local resources such as tax revenues and corresponding expenditures.

Budget Code

A twenty-digit code mandated by the TEA for Texas school districts to track resource allocations and expenditures. Figure 1 below shows the code structure.

Figure 1. TEA Budget Code Structure



Instructional Costs

Costs categorized under the TEA's Financial Accountability System Resource Guide's (FASRG) account code with a two-digit function code of 11-Instruction, 12-Instructional Resources and Media Services, 13-Curriculum Development and Instructional Staff Development, 31-Guidance Counseling and Evaluations Services.

Function Codes

The TEA defines a function as representing "a general operational area in a school district and groups together related activities" (available online at http://www.tea.state.tx.us/school.finance/audit/resguide12/far/far-101.html#P5701_468211). Function codes are two digit numbers that facilitate the tracking of expenditures by Texas school districts. The first digit represents the major area while the second digit provides detail of expenditures within the major area. For instance, function codes that begin with a "1" represent the major area of instruction with the second digit representing a specific area of instruction.

Administrative Costs

These costs are categorized under TEA's FASRG account code with a function code of 21-Instructional Leadership and 41-General Administration.

Student Support Related Cost

This category tracks campus administration costs such as the principal's office, social work services, medical costs, and co-curricular and extracurricular costs such as university interscholastic league and athletics.

Support Service Costs

These costs track school district expenditures such as transportation, maintenance and custodial, security and monitoring, data processing and community service.

Administrative Cost Ratio

A ratio used by the TEA to determine the relationship between administrative and instructional costs.

Enrollment

The number of students registered in a school district on a certain day who are eligible to receive funding.

Program Intent Code (PIC)

A two-digit component of the TEA code structure that tracks costs associated with various instructional programs.

Implications of the Study

With school districts all across Texas facing enrollment changes as a result of population shifts, how school district resources are allocated in light of these enrollment shifts is important as school finance, equity and adequacy seem to be issues that will be debated year after year, even if resources to school districts are increased. This study will contribute to the understanding of how school districts shift allocation of resources when enrollment changes, specifically looking at what functional areas gain or lose resources, what student groups gain or lose resources, and how enrollment changes affect spending per student. Policy makers interested in how school districts use scarce resources could use this work to better understand the expenditure dynamics of Texas school districts as they face enrollment changes and understand how fixed costs do not necessarily shrink as a result of decreasing enrollment or how administrative costs do not necessarily increase when a school district begins to experience increases in

enrollment. While the impact of changing allocation patterns on student achievement will not be discussed, the issue of enrollment and allocation patterns is inextricably linked to how students perform academically. This study fills a niche that complements other studies that use enrollment, resource allocation and expenditures per student to determine the impact on student achievement.

Organization of the Study

This chapter provided background information on the issue of changing demographics, changing student enrollments, and resource allocations and continued with a brief description of the study including relevant information on the background of the study as well as the problem delineation. Chapter two includes a brief review of the current literature on the use of data in school finance research, a review of the research on resource allocation, and a review of a conceptual theory that might explain the changes seen in resource allocations as a result of enrollment changes. Chapter three describes the data sources and methods used to quantify how the resources for both school districts were allocated over the school years 1997-98 through 2004-05. Chapter four details the results found from the research and how they address the four research questions posed. Chapter five provides a discussion of the research findings and what implications they offer for further research in the area of resource allocation. Finally, chapter six addresses other aspects of the school districts in the study that offer more insight into the environments each found itself during the eight years reviewed. These aspects may very well have served as catalysts for changes in resource allocations.

CHAPTER TWO

A Review of the Literature

This chapter presents an overview of the various research areas that deal with resource allocation in school districts. Given that resource allocation in schools is a multi-faceted area of research, care was taken to include only those areas of research that could help frame the study at hand. While the research areas reviewed are certainly not inclusive of every area tangential to resource allocation, they are germane, provide the necessary background for this study, and offer possible explanations for the results found in this study.

This chapter begins with a discussion of the collection and use of school and district level data in school finance research. This discussion will illustrate the issues associated with collecting and using that data to draw any kind of definitive conclusion based on the research conducted. The chapter then continues with a review of the relevant literature on resource allocation research conducted on public schools. The review will demonstrate that much of the research performed on school districts' resource allocation looks for a link between resource allocation and student achievement. That is, how does the allocation of a school's resources, whether human or otherwise, affect how students perform on achievement tests? There has also been some research conducted on how school districts change their resource allocation patterns as a result of the district undergoing changes in student enrollment. While this research is limited, it does provide a basis for this study.

This research suggests that resource allocation patterns in school districts that undergo enrollment shifts may not necessarily make economic sense. That is, how resources are allocated—and how much is spent per student—is perhaps counterintuitive in districts that experience changes in student enrollment. The review of that literature provides a logical segue into the next area covered which is a review of a theory referred to as budget maximization. Budget maximization theory suggests that school districts, like other public sector organizations, are not motivated by profit and, therefore, attempt to maximize their budgets despite organizational conditions, such as decreasing enrollment, that would suggest a different course of action. The review of the budget maximization literature may help to explain the recondite nature of school district resource allocation patterns and facilitate a discussion that may help explain the resource allocation patterns exhibited by the school districts in this study.

The Collection and Use of Data

Ever since the first school district allocated its first dollar, how school districts allocate resources has been a topic for discussion and research. Whether the conversation was in the realm of scientific inquiry, in the halls of federal government or state legislatures, research findings, opinions, and laws have been written to explain or control how schools use resources. Given that the United States spent $511 billion on public elementary and secondary education in 2003 (Snyder et al., 2006), it is easy to see why this topic generates so much interest from disparate parties. With such enormous amounts of resources used in public education, it is apparent why this topic is such a fixed landmark on the landscape of public school finance research.

However, before any research or analysis can be performed, before any policies can be made from the results of that research and analysis, before any relationships can be gleaned from resource allocation data, determining what data to obtain becomes central to answering any research questions posed. Once a decision is made on which data to collect, it is another matter entirely to determine if, for instance, the data is even available, or if extrapolations must be made from available data. Research studies have been conducted using district-level data to obtain information on how districts allocate funds to individual campuses (Baker, 2003), how school district size, usually measured by student enrollment, affects student achievement (Driscoll et al., 2003; Friedkin & Necochea, 1988), or simply how the number of enrolled students affects the district's internal allocation of resources (Monk, 1984). However, with a general lack in the availability of school-level data, researchers must use district-level data to extrapolate how districts allocate funds to individual campuses and then make a determination if the campus' use of funds relates to how well their students perform academically. Picus (2001) draws the obvious conclusion that collecting data closer to the "unit of production" (p. 78) produces results that are more relevant in answering questions regarding the impact of resources on student achievement. While the unit in Picus' scenario is the individual campus with the "production" being educated students, it does not take a stretch of the imagination to further parse the unit down to the classroom to look for relationships between achievement and classroom size (see for example, Howley & Howley, 2004). However, even with limited data at the school-level, some studies have used classroom-level data but all these are very specific and do not lend

themselves well to the kind of meta-analysis on school or district-level data such as those conducted by Hanushek (1989) and Hedges et al. (1994).

While a school district will spend a large portion of its operating budget on student support services such as transportation, maintenance, and administration, the school is still the cost center for the majority of educational expenditures incurred by school districts. The school, therefore, is suitable as the organization to study to determine how its allocated resources affect student achievement. This is not to say that the impact of non-educational costs on student achievement goes unnoticed. Brewer (1996), for instance, looked at the effect of administrative costs on educational productivity but did not find any relationship between them in his study. The need to establish some kind of relationship between non-educational expenditures and student achievement could be motivated by policy makers looking to drive down the cost of administration. Brewer's study was conducted to address specifically the criticism leveled at school districts' administrative expenditures. While his results were inconclusive, they did offer insight into the relatively small portion school districts spend on administration and added to the body of literature on how schools allocate resources.

While Brewer's research on administrative expenditures was conducted to look for a specific relationship between one component of school district expenditures and student achievement, other research on resource allocation uses total expenditures to look for relationships to help explain what factors in resource allocation matter most towards increasing student achievement. Some may view this as a researcher's folly:

looking for relationships that do not exist. But with so many possibilities of what causes increases—or decreases—in student achievement, many different relationships have to be explored. However, because of the axiom "money makes a difference in education", the use of instructional expenditures, both direct and indirect, is the mainstay for education finance research. Although educational expenditures provide a useful lens for analyzing relationships between direct educational resources and student achievement, Picus (2001) does note that school-level data should, and quite often does, include information on staff qualifications, enrollment, average daily attendance, and students' demographic information which potentially provides more robust data on how resources and other factors relate to student achievement or on how total resources are allocated at the school-level.

Given its wider availability, district-level data, rather than school-level data, has traditionally been the unit of analysis in education finance research. However, some researchers, more interested in how resources are allocated to the school, have used district-level data as a proxy for school-level data, thereby getting closer to Picus' (2001) unit of production analysis. The research has been limited to those states that have comprehensive district-level collection systems. The much sought after relationship between resources (inputs) and student achievement (output) is the basis for numerous studies on resource allocation, although using district-level data only to draw any conclusions on how school-level resources affect student achievement seems, at best, tenuous.

Clark's (1998) study used district-level data from eight large Texas school districts to determine if resources were allocated to students based on academic need and, if so, whether or not the resources helped with student achievement. Using district-level data to estimate school-level data, the results showed that districts' allocation of resources did not exhibit any consistent pattern of following those students with the most academic need. In addition, the one district in Clark's study that did have a positive correlation of increased resources to students with the most academic need showed "little measurable effect from the resources" (p. 388). This finding adds to the body of literature that supports the notion that an increase in resources does not always lead to a corresponding increase in student achievement. While Clark's study used a sample of large school districts, no analysis was conducted to determine any relationship between resource allocation and district size despite that data element being available. In other words, the variability of resource allocations was not tied to any enrollment differences between the eight Texas school districts in Clark's study. While this is not a criticism of Clark's study—indeed, the study used specific variables that did not include size—it does show that size as a catalyst for how resources were allocated was not considered. While Clark did note that large districts tend to allocate resources to campuses based on campus size and enrollment and not on other variables such as student achievement, this was a general comment and not meant to pertain specifically to the districts in the study.

Picus (2001) argues that school-level data could help policy makers determine the impact of additional resources on student achievement. Picus notes that because of the "potential richness" (p. 93) of school-level data, other issues central to studies in

resource allocation such as adequacy, efficiency, and equity become tractable. However, Picus cautions that collecting school-level data is fraught with issues that may mitigate the benefits including the administrative cost of collecting school-level data, the potential lack of comparability, and the absence of models that may help explain reasons why schools allocate resources differently. Nonetheless, states such as Texas, Ohio, North Carolina and Florida that utilize district and campus data collection systems have forged ahead with complex data collection systems that seem to offer a better picture of the financial operations of individual schools and increased accountability (Picus, 2001). No wonder then that education and finance research using school and district-level data from these states has increased. (For example, Clark, 1998, using Texas data; McMillen, 2004, using Ohio data). This is not to say that states that do not collect school and district-level data are not actively engaged in trying to determine the best mix of resources.

Bowles and Bosworth (2002) analyzed school-level data from Wyoming schools to determine how the size of schools affected economies of scale and, more importantly, how these scales affected educational opportunities for students. Bowles and Bosworth pointed out that while the results they obtained were important, the data they obtained and the technique used to analyze the data were equally as important, recognizing the importance of using school-level data to answer questions dealing with student achievement issues. Using school-level data, Bowles and Bosworth found that smaller schools in Wyoming had a disposition to spend more per student than larger schools. Based on this finding, Bowles and Bosworth made the assumption that administrators in

each district tried to distribute resources in a way that would produce equitable outcomes in student test scores. After controlling for individual school characteristics that might explain why they spent varying amounts per student, the researchers concluded that in Wyoming, it costs more per student in smaller schools to achieve the same test scores achieved by larger schools. Indeed, they find that "averaging across school type, an increase of 10 percent in school size decreases cost per student by approximately 2 percent" (p. 299). They conclude that Wyoming's school finance system would need to address these economies of scale, ostensibly suggesting that it should take the same number of dollars per-student, regardless of the size of the school, to obtain the same achievement results.

While the research conducted by Bowles and Bosworth (2002) used school-level data, Monk's (1984) trenchant analysis used district-level data from 466 kindergarten through twelfth grade districts in New York State. Monk used size as a variable in his study to determine how that variable affected resource allocation. He found that "size appears to make a difference in terms of how school districts spend their funds" (p. 62). Unlike Bowles and Bosworth who found that smaller schools spent more per student than larger schools, Monk found districts that increased enrollment in grades 9-12 and actually spent more on instruction than those districts that did not see similar increases.

Two different research studies, both using enrollment as a variable, found conflicting results regarding how size affects expenditures per student. It should be pointed out that the studies by Monk and Bowles and Bosworth found different results using different grade spans. Bowles and Bosworth used school enrollment in all grades

while Monk, despite having data for the all grade spans, used district enrollment only for grades 9-12 to make his finding that higher enrollment leads to more cost per student. However, the main thrust of Monk's pioneering study was to determine how the size of a school district[1] affected the internal allocation of its resources, specifically "the extent to which these size variables are related to (a) the mix of educational services provided" (p. 49). Ultimately, Monk found that different aspects of school district size affected how resources are allocated. While enrollment data for grades 9-12 showed a relationship between higher spending and higher enrollment, geographical size of the district "was negatively related to the share spent on instruction" (p. 54). Monk cautions that the expenditure data used in his study was an aggregation of various costs and that in order to read more into the empirical results, "a more detailed comparison of specific services, such as biology instruction as compared to French instruction…would reveal more of the differences the model [used in his original analysis] attempts to explain" (p. 63).

Monk's (1984) cautionary note regarding the results obtained from using aggregated expenditure data was revisited several years later in his analysis of the challenges facing researchers who collect and use school-level data (Monk, 1997). In that analysis, the focus was on the need for relevant, school-level data in order for good education policy to be made using that data. Monk argued that while policy issues have largely focused on the school-level, they have done so without the benefit of having

[1] Size in Monk's 1984 study was broken down into six variables: 1) enrollment; 2) geographical size in square miles; 3) number of elementary schools; 4) average enrollment of elementary schools; 5) coefficient of variation associated with enrollment in elementary schools; 6) relationship between enrollment and geographical size.

good, reliable data on school-level expenditures. Good data, for instance, details how much money is spent on various school-specific instructional programs or how much time is spent by teachers and students in various instructional programs. It is interesting that Monk's 1997 analysis, fully thirteen years after his research on New York State school districts, still echoes the same caution regarding the reliance placed on data that is aggregated, and not school specific, if any sense is to be made of the results.

Cohen (1997), writing contemporaneously with Monk (1997), agrees with him in principle that good school policy begins with the collection and analysis of good data. Indeed, Cohen stresses that "allocation patterns…can contribute to the decision making process" (p. 255). Using the state of Ohio as an example, Cohen detailed how that state's revamped system of collecting school financial data created "building blocks on which a particular set of policy questions, in theory, could be asked" (p. 257), perhaps also creating more avenues for research on resource allocation. Prior to the redesigned data collection system in Ohio, Cohen explains that the Ohio Department of Education was relegated to answering basic questions that dealt with how many students were enrolled or how much was spent district-wide. These two sets of data are important components in establishing the first relationship between what is spent in relation to how many students are enrolled, although they do not address the issue of student achievement directly. Nonetheless, changes in student enrollment in relation to what is spent by instructional or functional category, rather than what is spent in the aggregate, seems to be a rich area for investigation. The analysis performed by Cohen, much like Monk's (1997), was not an investigation on a particular school to look for a relationship between

resources and other variables. Rather, it was a clarion call to other researchers about the potential pitfalls associated with collecting and using this expenditure data for educational policy purposes. The use of expenditure data, Cohen cautions, need not be looked at in a vacuum. Rather, the expenditure data, if properly reported, is indicative of what is happening instructionally, although as Mintzberg (1979) duly noted, "the data do not generate theory—only researchers do that" (p. 584). This is not to suggest that Cohen or Monk argue that the data ought to dictate policy alone. But Cohen and Monk bring attention to important issues for researchers interested in collecting and using financial and student data—school or district-level—to serve as a catalyst for educational policies and for researchers simply looking to study the resource allocation patterns exhibited by school districts.

Resource Allocation Research

The literature is replete with studies performed on the subject of how schools allocate financial and human resources. Whether the issue is how resource allocation patterns affect student achievement or what factors cause school districts to allocate resources in particular ways, the topic is one that permeates the literature on educational finance research. While resource allocation in schools has been an important topic throughout the 20th century, the study often regarded as the seminal work on modern resource allocation research is the 1966 report *Equality of Educational Opportunity* (Coleman et al., 1966), more commonly referred to as the *Coleman Report.* That study began the discussion of how resource distribution, particularly by ethnicity, affected student achievement (Hanushek, 1986). In results that are disputed even today, Coleman

et al. (1966) found that resources had little or no impact on student achievement. Rather, as Hanushek (1986) noted, "family background and the characteristics of other students in the school seemed much more important" (p. 1180).

While the *Coleman Report* found no relationship between resource distribution and student achievement—results that are both disputed and supported even today—it also sparked a debate regarding the methods used in the study. Not only did the *Coleman Report* begin a decades-long debate on the impact resources have on student achievement, it was also one of the first studies to utilize production function methodologies. Both Hanushek (1986) and Pan, Rudo, Schnedier and Smith-Hansen (2003) agree that the use of production function methodologies by Coleman et al. (1966) to arrive at their conclusions only contributed to the debate regarding the relationship between allocation of resources and student achievement. Pritchett and Filmer's (1999) review of production function research provided a succinct definition of a production function, noting that it is "an expression for the maximum amount of output possible for an amount of inputs" (p. 224).

The production function has been used in many studies of the relationship between resource allocation and student achievement. Naturally, the inputs analyzed are the resources used in education, such as staffing and instructional materials, while the output is usually some measure of how students perform on standardized tests (Picus, 2001). Pritchett and Filmer (1999) found that the use of educational resources to lower class size was not as effective as other uses of resources. By using a production function model, they argued that there are inefficiencies in how school systems spend and

allocate resources, particularly in teacher inputs. Thus, hiring more teachers to lower class size was seen as an inefficient use of resources especially when lowering class size did not contribute to higher student achievement.

Pritchett and Filmer's (1999) use of the production function to measure the effectiveness of resources demonstrates the limited usefulness of the function. They acknowledge this by commenting that, "one of the puzzles in the literature on educational production functions is that it is often difficult to demonstrate a positive impact of increased spending on educational outcomes" (p. 233). Hanushek (1986) notes that criticism of the production function stem not from the method per se but from the results obtained by using the method, namely the apparent inefficient use of resources by school districts. While Pritchett and Filmer found the use of teachers as a resource input did not positively impact student performance, they did not address specifically what inputs would produce an increase in student performance. While they showed which resources had no impact on student achievement, their research offered little to say what does. They do point out that the assumption that resources are always allocated in a way to maximize educational output is incorrect. They suggest a reallocation of existing resources could improve student performance without the need for additional resources.

Walberg and Fowler's (1987) study of New Jersey schools supports the notion that schools are inefficient in their use of resources. Walberg and Fowler looked for specific variables to determine how those variables impacted student achievement. Unlike Pritchett and Filmer (1999), Walberg and Fowler found variables that did

increase student achievement, namely levels of socio-economic status (SES), enrollment, and expenditure per student. They also found that expenditures had no correlation to student achievement. In fact, they found that New Jersey school districts that spent more per student had lower student achievement. This gives credence to Pritchett and Filmer's notion that schools do not use resources effectively or at least supports the argument that an increase in resources does not lead to a corresponding increase in student achievement. Walberg and Fowler also found that after taking district size and SES into account, larger schools were "generally less efficient in enhancing student achievement" (p. 12) than smaller schools. Ultimately, the study by Walberg and Fowler indicated that it was not levels of expenditures that mattered but "educational policies of districts and the instructional practices in classrooms…that consistently determine achievement and efficiency" (p. 13). The study suggests that it is more prudent to efficiently use existing resources in a way that bolsters student achievement than to increase resources and not see the same increase in achievement.

In their analysis of research on educational productivity, Odden and Clune (1995) noted the major findings were that "dollars are not used in ways that directly raise student achievement" (p. 6). However, they began their analysis by first dismissing the claim that administrative expenditures contribute to low educational productivity, thereby exonerating what former Education Secretary William Bennett referred to as the "administrative blob" (Brewer, 1996). Brewer reached the same conclusion in his study of the impact of administrative expenditures on test scores. Brewer found no relationship between increases in administrative expenditures and decreases in test scores. Odden

and Clune found that districts tended to use increases in resources to hire more teachers, yet found no evidence that this use of resources boosted student achievement. However, their analysis did lead them to suggest ways in which schools can use existing resources to make schools more productive by way of increasing student performance.

Other aspects of the relationship between student achievement and resource allocation include variables such as the SES of students and the size of the school district. In Friedkin and Necochea's (1988) study, conducted to test a theory on the relationship between the size of a school system and student performance, they found "that school system size generally has a slight negative influence on performance" (p. 244). The theory used SES as a determinant for which direction student performance would take in relation to a school system's size. Friedkin and Necochea found that large schools with a population of low SES students hampered student achievement. However, the negative effect size had on student performance was essentially eliminated as the SES of a school system increased. It should be noted that Friedkin and Necochea made the assumption that as a school system's SES increases, the "increases in school system size generates many opportunities for improved system performance and few constraints on *allocation of system resources"* [italics added] (p. 245). Thus, while Freidkin and Necochea's research ostensibly supported the notion that low SES students would perform better in smaller schools, it can be argued, based on their research conclusions, that it is really a matter of resource allocation that improves student performance, not smaller classes, schools, or districts. However, the opportunity for better allocation of

resources seems to rest with larger school and school districts. Two separate studies conducted in 2000 and 2003 also drew attention to this issue.

The study in 2000 by the University of Texas' Charles A. Dana Center, in conjunction with the Southwest Educational Development Laboratory (Alexander et al., 2000) was conducted to better understand the relationship between student performance and resource allocation. The study used 744 Texas school districts [out of a possible 1,042] as its sample and concluded that Texas school districts with higher academic performance spent more per pupil in the area of instruction. The researchers noted a "positive relationship between resource allocation and district performance" (p. 32). However, the data set used did not distinguish between large or small districts. Therefore, the only conclusion reached was that higher instructional spending produced higher levels of student performance. Whether the increase in instructional spending was the result of districts employing more teachers to lower class size was not determined. Indeed, the research did not include any data on class or school size, and simply used total expenditures[2] to derive student performance relationships.

Unlike the Dana Center study, the study conducted by Pan et al. (2003) for the Southwest Educational Development Laboratory did take into account human resource allocation patterns, and found that high performing districts tended to spend "more on instruction per pupil and employed more teachers per 1,000 students" (p. vi). Thus, the results mirror the Dana Center study in that there was a relationship between increased

[2] The Dana Center study did break out expenditures by classification (e.g., instruction, administrative, etc…) but that data could not establish whether a school system used smaller classes or schools to achieve improved student performance.

resource allocations and an increase in student performance. Pan et al., however, recognized a specific increase in spending, namely an increase in instructional spending that translated into employing more teachers which effectively lowered class size. This allows one to draw the conclusion that smaller class sizes do impact positively student performance. It should be noted that the Dana Center study used only Texas school districts in its sample. The sample of districts in the Pan et al. study consisted of all school districts in Arkansas, Louisiana, New Mexico and Texas. In addition, neither the Dana Center nor the Pan et al. study used the SES of students as a variable. Clearly, depending on the data set used, any conclusions drawn can be altered if one were to include specific variables that change the dynamics of the variables. For instance, most of the studies discussed above found some relationship between resources and student achievement. In addition, using the SES of students as a measure indicated a relationship between the size of a school system and the level of student performance. But, if one were to ascertain a relationship between the number of teachers employed and the level of performance for different levels of SES students, the data might indicate results that are counter to what was found in the studies above, despite using the same data set but adding another variable.

While they found that districts employing more teachers generally had higher student performance, Pan et al. (2003) recognized that the most important component of achieving student performance was how a district allocated fiscal and non-fiscal resources to "support a process of school reform" (p. 91). Similar results were found by

Hedges et al. (1994) in their meta-analysis of research studies that looked for effects of resource inputs on student outcomes.

Hedges et al. (1994) reviewed the same data used by Hanushek [cited in Hedges et al.] in which Hanushek concluded that there was no relationship between expenditures and student performance. Hanushek's conclusions, widely seen as the drawing of the proverbial line in the sand, were refuted by the research findings of Hedges et al. despite using the same data. The analysis by Hedges et al. showed a "systematic positive pattern in the relations between educational resource inputs and student outcomes" (p. 8). However, their review indicated that, "the typical effects of class size (expressed either as pupil/teacher ratio or teacher/pupil ratio) are decidedly mixed" (p. 11). Perhaps the most interesting finding in their review was the use of "global resources" (p. 11), defined as per pupil expenditures, was more positively related to student performance than the application of resources in any one area such as classroom size reduction. They acknowledge that resources matter, but also note that specific allocations of resources may not help in all situations and that an appropriate increase in expenditures per student may be the key to improved student performance.

Student performance was the focus of a report issued to the Texas Legislature in 2004. In the report, Gronberg, Jansen, Taylor and Booker (2004) found that the costs associated with attaining a certain level of student performance depended on "district size, the cost of inputs (such as teacher salaries), and on the environment in which education outcomes are being produced" (p. 25). Gronberg et al. (2004) used a cost function approach to make this determination. In other words, they sought a model that

would "relate district spending to student performance" (p. 2) to determine how much a district would need to spend to produce a certain outcome. In this case, the outcome was how students would perform on that state's yearly student assessment. Two drawbacks to the cost function approach include the presumptions that schools are attempting to minimize costs in order to achieve the desired outcomes and that available resources are already being used efficiently. Perhaps recognizing the research that suggests otherwise, the authors allowed for the possibility that schools were not cost efficient or attempting to minimize costs. While Gronberg et al. found that producing the desired levels of outcome depended on a myriad of factors made even more complicated by the fact that the model developed would hold true only if the school's environment was held static, it was ultimately how a school district allocated resources that had the greatest impact on student achievement.

Enrollment and Resource Allocation

The relationship between student achievement and resource allocation permeates school finance literature. However, another relatively important issue in school finance has been largely ignored, as it does not initially attempt to draw any direct correlation to student achievement. How school districts change the way they allocate resources as a result of changes in student enrollment has been researched, but not to the extent necessary to have a body of literature that would facilitate a meta-analysis. Nonetheless, the limited research that has been done provides results that merit further study considering that many schools nationwide are experiencing increasing enrollment and budgetary constraints. How schools allocate resources in this environment will certainly

be at the forefront of discussions regarding what has the greatest impact on student achievement.

Bidwell and Kasarda (1975) reviewed the effect of several environmental factors, including size, on student achievement in 104 Colorado schools and found that numerous factors played a significant role in how well students perform. However, the size of school districts was found to have little effect on student achievement. Rather, the level of resources used had a greater positive effect than size, although "their direct effects were very small" (p. 69). The study by Bidwell and Kasarda was an early attempt to determine how a school district's organizational structure affected student achievement. Though enrollment and resource allocation were viewed as variables affecting student achievement, they were not correlated against each other. It would take a few years before that analysis would take place.

Monk (1984) conducted one of the earliest research studies on the relationship between the size of a school district and how resources were allocated. The impetus for this research stemmed from Monk's "need to search further for a conceptual rationale for believing that enrollment levels are related to internal resource allocation practices" (p. 44). In light of this need, Monk sought to develop a model that would explain how a school district's size affected the variability of resource allocations. Monk's research was reviewed earlier in the discussion of various data sets used in financial research. Monk's use of district-level data to determine how a school's internal allocation of resources changed as a consequence of size indicated that inequities resulted in resources allocated to various groups of students. In contrast to studying the overall

efficiencies of a school's allocation of resources—usually a measure of overall student achievement—Monk looked specifically at the how the size of a school system would impact the distribution of resources to different categories of students. Monk's results indicated that size does indeed play a role in how schools allocate resources to different categories of students. Monk also found that districts with low enrollment levels spent more on instructional supervision than they did on basic instruction. Using the categories Black, handicapped, special education, and enrollment in grades 9-12, Monk found, for instance, that enrollment levels had very little to do with amounts spent on special education. He noted that this was partly due to state mandated requirements that districts provide these services. Meanwhile, the percentage of Black students was positively related to expenditures made on teachers or, more simply, more Black students translated into more teachers. Monk did not offer an explanation for this phenomenon.

What is interesting in Monk's study is that it did not, nor ever sought to, speak directly to this issue of student achievement. Rather, Monk used the inequity in the distribution of resources as a proxy for student achievement, assuming that these inequities could produce corresponding inequities in educational opportunities. These inequities, one could argue, are the root cause of the student achievement gap between various categories of students seen in so many states. Further, size, defined in many ways in Monk's study, was the catalyst for differences in how resources were allocated. While Monk's different definitions of size, such as geographic and enrollment, showed different effects on resource allocations, size was nonetheless the driving force behind the study. Only after the results were obtained did Monk recognize that differences in

size of a school district could directly affect student achievement. Indeed, Monk notes that his results "suggest that heretofore neglected aspects of school district size deserve additional attention as background factors that may be related to differences in educational opportunities" (p. 63).

Another aspect of the relationship between student enrollment and resource allocation is how staffing patterns change in a school district as a result of shifts in enrollment. Data from the NCES indicate a nationwide increase in student enrollment (Snyder et al., 2006). Anderson and Mark's (1985) analysis, however, focused on staffing patterns in school districts that had decreases in enrollment. Their analysis of a select group of Missouri school districts found that despite a 30% decrease in student enrollment from 1962 to 1982, costs per student actually increased, in real dollars, by 23%. Anderson and Mark tested six hypotheses using enrollment and financial data from approximately 56 school districts located near the St. Louis metropolitan area. The data covered the years 1969 to 1982. One hypothesis concerned the relationship between administrative expenditures made and declining enrollment. Anderson and Mark hypothesized that as enrollment declined, resources allocated to administration and administrative support positions would increase. The data collected supported their hypothesis in that the number of administrative and administrative support positions actually increased despite declining enrollment. It should also be noted that within the time frame of their study, budget reductions were causing many of the schools in the sample to make decisions regarding staffing allocations. Their results led them to conclude that it takes "relatively large reductions in budget growth before districts are

forced to alter the processes by which the administrative component grows" (p. 306), also noting that reductions in administrative and support personnel occurred only after several years of budget reductions and enrollment declines.

While Anderson and Mark's study did not implicate school administrators as charlatans vying for more resources in times of both declining enrollment and budgets, it did raise the specter of school districts having to cut, or curtail, educational resources in favor of administrative expenditures when enrollment declines. In fact, the data analyzed by Anderson and Mark showed a 1.7% increase in teaching positions while administrative positions increased by 7.8% despite decreasing enrollment. However, clearly both administrative and teaching positions contributed to an overall increase in per-pupil expenditures as indicated by the study. While it seems natural that enrollment declines would contribute to a reduction in instructional expenditures, or at least a moratorium on increases, increasing administrative positions seems counterintuitive considering those positions usually remain fixed over a certain span of enrollment.

Edelman and Knudsen (1990), commenting on the Anderson and Mark study, offered a plausible explanation for the increase in administrative positions. They surmise the increased complexity of running a school system and the requisite increase in paperwork makes it difficult to reduce either instructional administration or support service administration. Indeed, it would seem that this complexity would dictate an increase in administrative staff regardless of whether a school district has undergone an increase or decrease in enrollment.

We have already seen the increase in the cost of public education in the United States and the recent increase in student enrollment. However, as Anderson and Mark (1985) found, not every school district has experienced an increase in enrollment (Snyder, et al. 2006). Districts that have lost enrollment have nonetheless continued to see their educational expenditures increase. Whether the increase in teaching or administrative positions have contributed to the increase in per-pupil expenditures, vis-à-vis enrollment declines, was the basis of one study that sought to answer this question.

Cavin et al. (1985) conducted a study to test the assumption that increases in costs per-pupil are caused by declining enrollment and school district's inability to react quickly enough to reduce inputs. In addition, they wanted to know how shifts in enrollment caused shifts in per pupil expenditures, both in the short and long run. A corollary issue was whether per pupil expenditures reacted differently to increasing and decreasing enrollment, or, in the words of the researchers, "why per pupil expenditures are sensitive to enrollment changes" (p. 430). With ten years of enrollment and expenditure data from all Michigan school districts, their data set included over five hundred school districts that had wide ranges of enrollments and expenditures per student. In addition, over the ten-year period, many districts in the study had experienced both enrollment increases and decreases. This allowed the researchers to determine how per pupil expenditures reacted to enrollment increases and decreases within the same school district. The results indicated that expenditures per pupil did indeed change as a result of changing enrollment, but what is more salient is the additional finding that changes in expenditures per student were more pronounced in the

short run rather than the long run. But, the direction of the enrollment shift also mattered in how the districts reacted.

Cavin et al. (1985) noted that districts with declining enrollments of 20% over a two-year period reacted slowly to losing students, thus leading to increases in per pupil costs over the short term. Reacting slowly entailed not reducing staff or resources, thus spreading roughly the same costs over a smaller number of students. However, by the third year the district finally shifted and cut resources and reduced expenditure per pupil that stabilized at levels approximately 10% more than before the enrollment decline. Districts that experienced a 20% reduction in enrollment over a one-year period showed an even greater increase in per pupil expenditures the first year. Interestingly, after two years, their expenditures per student adjusted to the same levels as those districts with a two-year enrollment decline. For districts that experienced an increase in enrollment, cost per pupil went down but not as fast as the costs increased in districts with declining enrollment. For districts that experienced a 10% increase in enrollment for two consecutive years, the study revealed that these districts decreased costs per-pupil by 8%.

The short-run comparisons between districts that gained enrollment and those that lost enrollment showed districts that gained enrollment react quickly by increasing expenditures. While these districts will see a slight decline in expenditures per student, as expenditures are now spread over more students, the researchers found these districts reacted quickly to "elicit immediate increases in input levels" (p. 436). Further, because of the swiftness with which they adjusted resources, the researchers also noted "long

run adjustments to enrollment increases take place virtually immediately" (p. 436) whereas districts that lost enrollment took longer to make adjustments. While it seems intuitive for districts that gain students to make resource adjustments to compensate for more students, the researchers found that these districts returned to equilibrium faster than districts that lost students. In other words, districts that lost students were slow to make adjustments, perhaps in fear of having students return, or being unable, perhaps because of political reasons, to reduce staff. Thus, the researcher's test of the assumption that increases in per pupil expenditures are caused by enrollment declines and school district's inability, or reluctance, to make resource adjustments proved to be correct, at least for Michigan schools. In addition, the results indicated that the direction of the enrollment change dictated how schools would react in the short run.

The districts in the aforementioned studies reacted to enrollment changes primarily by changing staffing allocations. Since the majority of expenditures in school districts are salary related, how a school district adjusts staffing patterns plays a crucial role in determining expenditures per pupil. In the Cavin et al. (1985) study, no staff reductions were seen in some districts that lost students the first year. Interestingly, other districts increased teaching staff in light of declining enrollment. However, given the nature of hiring patterns for school districts, the researchers assumed that this was not intentional, but rather a consequence of the inability of school districts to accurately determine how many students will show up on the first day of school. In addition, since many districts hire staff months before the beginning of the school year, they may end up with additional staff members that have contractual employment rights, eliminating

the possibility of reducing staff immediately. Cavin et al. also noted the role federal legislation may play in requiring schools to staff at certain mandated levels despite a decline in enrollment. From a policy perspective, the researchers noted that state aid, at least in Michigan, was tied to enrollment levels and did not take into account the increase in expenditures experienced by districts that lost enrollment. Therefore, schools that lost enrollment and experienced increases in expenditures also saw a reduction in state aid. How policy makers deal with this issue is important as funding and enrollment levels are inextricably linked.

While the total number of students enrolled in U.S. public schools has increased, many areas of the country have experienced enrollment declines (Snyder et al., 2006). In states where enrollment dictates the level of aid, state aid has also decreased. But reductions in state aid are not necessarily always tied to decreases in student enrollment. For instance, the Center for Public Policy Priorities recently reported that Texas' share of public education funding had decreased from 47% in 1991 to an estimated 36% in 2005 (Center for Public Policy Priorities [CPPP], 2005) despite an increase of 30% in enrollment over the same time period[3] (TEA, 2007). However, as we saw in the study by Cavin et al. (1985), schools with declines in enrollment face different financial consequences than those with enrollment increases. School districts that gain enrollment experience increased costs overall but are compensated by increases in state aid. School districts with declining enrollment inevitably face a reduction in funding sources,

[3] Calculated using TEA, 2007, Table 2 on page 5, using the difference between 1990-91 and 2004-05.

whether state or local aid, and must confront this issue while they are also experiencing increased costs.

Edelman and Knudsen (1990) addressed the issue of state aid and declining enrollments. They wanted to know if states that distributed dollars to schools on a per capita basis should also take into account the financial peculiarities of school districts with declining enrollments and continue to fund them as if there were no enrollment decline. In a brief review of studies on school districts with declining enrollment, Edelman and Knudsen found that most of the studies found declining enrollment leading to higher expenditures per pupil. In their own study using school districts in Iowa, they looked at the impact declining enrollments had on the districts. What they found was similar to other studies in that cost per pupil increased while state aid decreased. In addition, they also noted the district's inability to react quickly to enrollment changes, ostensibly meaning that staffing was not reduced to levels that would cause costs per student to decrease as well. While these results have been reported in numerous other studies and add little to the literature on resource allocation, what made the Edelman and Knudsen study interesting was their estimation of how districts of various sizes would react, both in the short and long-run, to enrollment declines. This takes the study by Cavin et al. (1985) one step further by taking into account the different sizes of school districts that lost enrollment. Cavin et al., on the other hand, made no distinction in the size of school districts in their study.

Edelman and Knudsen (1990) divided all Iowa school districts into eight categories: those with 250 students or less and those with 3,000 or more, with six other

categories between in 250 enrollment increments. They found that smaller schools started with higher base per pupil expenditures but all districts, regardless of size, experienced higher costs per-pupil in the short-run, substantiating the earlier work by Anderson and Mark (1985). Interestingly, the data showed that all districts, regardless of size, would experience a 23% increase in costs per-pupil in the short-run, while long-run results showed larger districts being able to adjust better to enrollment declines by reducing cost per pupil. In fact, they estimated that the largest districts would actually be able to slightly reduce per pupil expenditures by .2%.

Based on the results, Edelman and Knudsen (1990) proposed three options that states could use when dealing with school districts with declining enrollment. The first was to have states make no adjustments and simply reduce state revenues commensurate with a decrease in students. Increases in local funding efforts would be necessary to absorb the additional costs and make up the loss of state revenue. The second option they proposed was for states to fully fund any increases in costs per student as a result of enrollment declines. This would alleviate the need for local revenues to supplement the loss of state revenues. In essence, states would continue to fund districts' enrollment at levels higher than are actually present. The third option would be to fund the increase in costs by not reducing state aid until the district had a chance to adjust to the enrollment decline and decrease costs per student.

Because Iowa implemented the second option, the researchers noted that because of declining enrollment, Iowa essentially funded "phantom pupils" (p. 327) resulting in funding for 31,000 more students than Iowa actually had enrolled. From a fiscal and

policy perspective, this caused the state of Iowa to fund at higher levels than was required and caused political pressure to change the method by which these enrollment declines were handled. In addition, the researchers suggested that such a system would inevitably cause inefficiencies in the funding system, leading to potentially "substantial increases in per-pupil funding with little basis for empirical justification" (p. 327). The researchers concluded that how long a school district takes to make adjustments to enrollment declines and how those changes manifest themselves would determine the best course of action for a state's funding mechanism.

Easton (1993), continuing along the same research path as Edelman and Knudsen, used school districts in Oregon to first evaluate how enrollment changes affected school district spending and, secondly, to evaluate how state aid should be tied to changes in enrollment. Regarding the first issue, Easton found that because of Oregon's method of distributing state aid to districts with declining enrollment, these schools had "higher spending levels than one would otherwise expect" (p. 76). In other words, he found what so many other researchers found, which is districts with declining enrollment spent more per student than districts with increasing enrollment. Easton also noted that levels of spending in those districts with decreasing enrollment outpaced even what would have been expected under the Oregon state funding system, which distributes additional funds to districts with declining enrollment. For instance, while the appropriation made to districts with declining enrollments was approximately $7 per student in 1985, the regression analysis performed by Easton suggested that a 1% decline in enrollment would translate into a $98 increase in spending per student. On the

issue of how state aid ought to be tied to enrollment declines, Easton used the results of the study to question the distribution of aid to districts with declining enrollment. Since the state of Oregon distributed approximately $7 per student in additional dollars to districts with declining enrollment, and those districts were projected to spend an additional $98 per student, the conclusion reached was that local funding would have to make up the difference. Since districts with declining enrollment already have a funding source available to mitigate the increase in costs associated with declining enrollment, Easton feels that "it casts some doubt on the provision of an allowance for decline in some state's school funding formulas" (p. 80).

The research reviewed thus far shows the multitude of areas that have been explored in trying to determine, among other things, how changes in school district enrollment affects the allocation and expenditure of resources. A common finding is that school districts have trouble adjusting how they allocate and spend their resources when they undergo changes in enrollment. Districts that lose enrollment are slow to adjust expenditures accordingly and as a result see an increase in costs per student. Conversely, districts that gain enrollment do make immediate adjustments to increase expenditures but not to the extent that costs per student remain constant. In these districts, costs per student have a general tendency to drop as the additional resources used are still spread over a larger number of students, resulting in a lower per student cost. Two sides of the same coin to be sure, but neither side tackles the issue of whether what is spent or allocated per student is the most efficient use of resources from an educational or operational perspective. Hannaway, McKay and Nakib (2000) reached a similar

conclusion in their study of changes in resource allocation patterns of schools districts in states that underwent educational reforms. While their findings indicated an increase of instructional expenditures in two of the four states reviewed, they were careful to note that they did "not presume that the changes are necessarily changes that contribute to greater productivity" (p. 60). Similarly, the research reviewed here suggests the allocation and spending behaviors exhibited by school districts are merely the result of organizational dynamics and not rational decision-making by the district's administration in the interest of educational productivity or student achievement. While the research *demonstrates* the fiscal behavior of school administrators, it does little to offer any insight into *explaining* the fiscal behavior of school administrators.

The final part of this chapter will explore a concept and the research applied to that concept that does address the fiscal behavior exhibited by school districts, especially those that undergo changes in student enrollment. The concept, commonly referred to as budget maximization, applies to varying types of organizations, primarily non-profit and governmental. The body of literature dealing with this concept implicates the bureaucratic nature of governmental organizations as the reason budgets for these organizations seem to grow unchecked despite economic or operational conditions that would call for a reduction, or at least a moratorium, on increases. While the concept spans many decades, the literature has only recently been punctuated with research applying the concept to school districts. The limited but growing research of this topic applied to school districts demonstrates how schools follow the budget maximization pattern that is predicted by the theory. Already reviewed has been the research

conducted on how a change in enrollment affects a school district's financial allocation patterns. Budget maximization theory seems to offer the best explanation for the financial allocation patterns exhibited by school districts that experience enrollment changes.

Budget Maximization Theory

A growing area of research may help to explain why school districts and other government entities maximize budgets despite economic conditions that would suggest otherwise. As we have seen, some schools districts with declining enrollment may actually experience increasing budgets, leading to increases in costs per student. Research studies reviewed earlier prove conclusively that some school districts with declining enrollments may spend more per student if they do not adjust budgets downwards. This behavior has caused some (Staaf, 1977a) to implicate school districts as budget maximizing agencies and others (Rolle, 2004) to question whether school districts are indeed exhibiting behavior indicative of a budget maximizing agency.

The idea of a budget maximizing agency stems from Niskanen's (1971) work that later developed into his budget maximization theory. This theory is the notion that public agencies, such as school districts, have no motive to seek a state of cost minimization (Niskanen, 1971). That is, with no profit motive or customers to satisfy, the public agency will seek to maximize budgets as, according to Niskanen (1968), this serves as a proxy for monetary benefits for the administrators, or bureaucrats, responsible for the budget. Niskanen (1971) developed the concept of the budget-maximizing bureaucrat as a way to explain the behavior exhibited by public sector

managers. Noting that managers in public sectors desire the same kind of recognition as their private sector counterparts, Niskanen (1971) took the position that any theory developed explaining the behavior of bureaucrats would have to take into account the personal preferences of the bureaucrat if it were to be considered valid. The bulk of Niskanen's work on this concept is detailed in his seminal work on budget maximization theory, *Bureaucracy and Representative Government* (Niskanen, 1971), although an earlier work of his detailed his ruminations on the concept of budget maximization and provided the basis for the ideas he later developed.

Writing in 1968, Niskanen believed economic research at that time provided "no theory of the maximizing bureaucrat" (Niskanen, 1968, p. 293). Niskanen also found the focus of public administration at the time was to provide for a system that assumed the bureaucrat wanted to be efficient. However, Niskanen found this focus lacking as it did not take into account nor recognize "the conditions for which personal objectives of the bureaucrat are consistent with the efficiency of the bureaucracy" (p. 293). While this served as an impetus for him to develop his later work on budget maximization and bureaucratic budget behavior, this work focused on developing a model of the budget maximizing bureaucrat. Niskanen wanted to develop a model that would answer questions about bureaucracies and bureaucrats that economists of the late 1960s could not. Specifically, Niskanen wanted to know what the distinguishing characteristics of bureaucracies were, and regarding the bureaucrat, what they maximized, and under what conditions.

The theoretical model developed by Niskanen (1968) to answer those questions was based on the assumption that two characteristics of the bureaucracy were that "bureaucrats maximize the total budget of the bureau…[and] bureaus exchange a specific output (or a combination of outputs) for a specific budget" (p. 293). With these assumptions, and applying the model to private industry and bureaus alike, Niskanen's model predicted that a bureau's growth of output would outpace private industry in similar conditions. However, the bureau's usefulness, Niskanen suggested, would quickly dissipate, as demand for the product produced by the bureau would decrease. However, because the bureau had created a surplus of output, the desire to have the bureau continue would come not from those using the bureaus output, but from the bureau itself.

Predictably, one manifestation of that desire would be to "exhaust the obtainable budget" (Niskanen, 1968, p. 303). It is interesting to note that Niskanen's early work on budget maximization was done while serving as an analyst for the Institute for Defense, an organization that provided services to government organizations although not one itself. This is interesting because by the time he finished his seminal work on budget maximization theory, he was a self-described federal bureaucrat working for the Office of Budget and Management, the government agency responsible for developing, implementing and administering the president's budget, arguably the largest budget in the United States and certainly representing one of the largest bureaucracies in the world.

Niskanen's early work on budget maximization was done while working closely with, although not part of, a federal bureaucracy. By his own account, Niskanen "came to recognize that there is nothing inherent in the nature of bureaus and our political institution that leads public officials… [to] act in the public interest" (Niskanen 1971, p. vi). This led him to conclude that the general population was not well served by the institutions created in a representative government. While Niskanen's early work focused on developing a model to address questions regarding a bureaucracy and its characteristics, his treatise on budget maximization focused on the bureau and its environment, asking what "budget and output behavior should be expected of bureaus under different conditions?" (p. 9).

Niskanen (1971) never addressed school districts directly, but one of his defining characteristics of a bureau, namely that the owners and employees "do not appropriate any part of the difference between revenues and costs as personal income" (p. 15), includes all nonprofit organizations and institutions of education. Further, in defining a bureau's relationship with what Niskanen called a 'sponsor', Niskanen notes that bureaus are financed by "a collective organization" (p. 24) that in turn derives its revenue from taxes.[4] With regard to the relationship between the sponsor and the bureaucrat, Niskanen sees little dialogue, if any, about output between these two parties. That is, the budget discussion between bureaucrats and sponsors consists of tying budgets to activity levels, rather than activity level to output. Having spelled out

[4] The collective organization in a school district would be an elected school board.

different motivations of bureaucrats and the players involved, Niskanen sums up his theory as such:

> Bureaucrats maximize the total budget of their bureau during their tenure, subject to the constraint that the budget must be equal to or greater than the minimum total costs of supplying the output expected by the bureau's sponsor. (p. 42)

Following the work of Niskanen, others used his theory of the budget-maximizing bureaucrat to apply to various governmental agencies. In Staaf 's (1977a) analysis of public schools as bureaucracies, he recognized that "by almost any criterion…the educational bureaucracy is one of the most important factors that influence the magnitude and growth of government" (p. 150) when measured by the number of people employed, the resources received, and the educational expenditures incurred as a percent of gross domestic product. Staaf also applied one of Niskanen's (1971) definitions of a bureaucracy to teacher and administrator behavior in that there is no incentive for either group to be cost efficient. Noting that cost savings in the organization are not appropriated to individuals as compensation, Staaf concluded that for teachers and administrators alike, "there is no financial incentive to introduce cost saving techniques or practices" (p. 156). Because of this, Staaf felt cost saving measures may act as a deterrent since budgets, sometimes determined by previous year's expenditures, would have inherent pressure to remain constant or increase.

Staaf (1977a) also considered increases in salaries to be a large part of the growth of the educational bureaucracy. Staaf felt salaries and salary schedules were tied to a person's educational level and not on output, a situation that benefited both teachers

and administrators. Salaries, he argued, are dictated by circumstances unrelated to an output measure. In fact, Staaf's (1977b) review of the impact district consolidation had on the education bureaucracy showed that salary schedules for administrators were even tied to some measure of size, usually student enrollment or the number of subordinates. Teachers, he also noted, benefited from higher salaries simply from the larger size of the school district, regardless of student achievement. Even if student achievement, the obvious outcome measure, were to increase, that would not necessarily generate additional dollars for teachers or administrators as, for both groups, size and education level serve as the catalyst for compensation levels. These situations provide no incentive for either increasing output or minimizing costs, but do create an environment for a budget maximizing bureaucracy.

While Staaf (1977b) noted the impact consolidation had on salaries, he also found that consolidation could play an important role in affecting a district's bureaucracy. In particular, Staaf theorized that while there was clear evidence of a positive relationship between higher salaries and school district size, the increase in salaries were the result of decreased competition for education services. In addition, Staaf also assumed that bureaucrats who were interested in increasing their own utility (i.e., income) and had the ability to affect a district's consolidation efforts would "behave rationally" (p. 135) and do so. Blais and Dion (1991) noted so much when, in the introduction to their book that provided a forum for discussion on the concept of the budget-maximizing bureaucrat, they began by assuming that bureaucrats maximize budgets "because it is in their best interest to do so"(p. 3). While this behavior fits

within the framework of the budget maximizing bureaucrat as Staaf and others point out, Staaf also notes that consolidation does not serve the taxpayer well as consolidation, perhaps the bailiwick of the education bureaucrat, serves to "increase their [bureaucrats] salaries with no significant change in either other costs or school outputs" (p. 142).

Rolle (2004) critiqued traditional economic analysis used to cast schools as financially inefficient because that analysis did not address "to what extent, and under what circumstances, are individual or bureaucratic desires reflected in the organizational outcomes" (p. 278). Rolle also notes that traditional economic analysis, usually involving some type of production function, assumes that schools act as cost minimizers. Looking to address the issue of schools as inefficient organizations, Rolle applied the concept of budget maximization to Indiana K-12 schools to determine if those schools acted in a way predicted by the theory.

Rolle tested average daily attendance, graduation rates, remediation rates, and school quality[5] against levels of expenditures. Rolle found that because expenditures were increasing every year, the application of budget maximization theory to analyze how efficient Indiana schools were was a more appropriate measure than traditional economic analysis. Indeed, expenditures are considered the main input of resources and with increases every year it was a sure sign that budgets were increasing as well. Rolle's analysis showed that Indiana schools did not act as budget maximizing bureaucracies, adding that Niskanen's (1971) model predicted concave down production functions. These concave up functions represented "economic behaviors to the converse

[5] School quality was a measure of how much funding was received, per student, from the state of Indiana's School Incentive Award.

of Niskanen's derivative assumptions" (p. 296). Rolle also found that "some statistically significant relationships do exist between current year total expenditures per pupil and previous educational outcomes" (p. 296), showing the possibility that budgets increased only when output increased as well.

While Rolle's (2004) analysis showed Indiana schools to be non-budget maximizing bureaucracies, he did temper his findings by recognizing the environment in which Indians schools found themselves during the period reviewed. Lawsuits against the state for inadequate distribution of resources and legislative actions affecting public education took place during the years data was collected. Rolle did not assume these events made his findings invalid, but rather suggested that any analysis using Niskanen's model first take into account "the fiscal history of a particular sponsor's expenditure preferences" (p. 296). He also recognized that persons responsible for budgets may distribute resources in order to meet organizational goals while at the same time distribute resources to appease sponsors whose goals may not be the same as the organization.

Niskanen's (1971) theory does provide a putative explanation for the seemingly errant budget and expenditure behavior of school districts. It also provides the methodology by which to determine if a school district has been economically inefficient in its use of resources (Rolle, 2004). The analysis in chapter four will use Niskanen's theory to possibly explain the expenditure behavior exhibited by the two school districts in this study. The study's intent is not to assess the fiscal efficiency of the two districts, but rather to determine how enrollment affected distribution of

resources. Other methodologies will be used to determine how these changes in enrollment affected distribution of resources to functional areas and various student groups in each district. Lastly, the relationship between enrollment and expenditures per student will be determined to explain how well a change in enrollment accounts for changes in per student expenditures.

CHAPTER THREE

Methodology

This chapter presents an overview of the research methodologies used for this study, including a restatement of the research questions, a description of the data sources used, the methodology used to address the four research questions and limitations of the study.

This study used a quantitative approach to address the research questions posed. Because of the ubiquitous nature of the expenditure data used in the study, direct relationships between the independent and dependent variables could be determined simply from analyzing the data. In addition, the research questions were specifically designed to take advantage of the student enrollment and financial data available and to analyze the relationship between student enrollment and other variables. The independent variable in the study, student enrollment, is the same in each research question in so much as it was the only independent variable used. Pedhazur and Schmelkin (1991) provide an eloquent framework for this study when they write, "scientific inquiry is the pursuit of relations among variables. It is the variability that attracts our attention, arouses our curiosity, and often impels us to seek explanations for it" (p. 173). Within this framework, the pursuit of this study was to look for relationships between the variables of student enrollment and allocation of resources, to quantify the variability in resource allocations because of enrollment changes, and to suggest explanations for any relationships uncovered. Or more simply, a comparison of variables was the main thrust of this study.

Nachmias and Nachmias (1992) define comparison—one of their components of research design—as "an operation required to demonstrate that two variables are correlated" (p. 104). This study uses comparison as the model to build the research design, specifically looking for any correlation between student enrollment and changes in resource allocation patterns. Another component of research design Nachmias and Nachmias extol is manipulation. Manipulation, as seen by Nachmias and Nachmias "helps in establishing the time order of events" (p. 104) and since this study looks at resource allocation patterns over an eight year period, it is important to establish that a change in the independent variable, student enrollment, preceded a change in the dependent variable, resource allocations. As such, all the following research questions are germane to the issue of resource allocations as they relate to the changes in student enrollment, both increasing and decreasing, exhibited by the school districts in this study.

Research Questions

1. How did resource allocation patterns in these two school districts change by major function area as student enrollment changed?
2. What specific functional areas in these two school districts gained or lost resources as student enrollment changed?
3. What categories of students in these two school districts gained or lost resources as student enrollment changed?
4. It is expected that there will be an inverse relationship between student enrollment and expenditure per student. As such, this study will seek to

determine, for each school district, the relationship between the effects of changing student enrollment and total expenditures per student.

The Data

The data for this study came from several sources. Since the data is historical in nature and does not allow for any field research collection, it fits more closely with what Nachmias and Nachmias (1992) term "secondary data analysis", or "research findings based on data collected by others" (p. 291). Indeed, the data used came from others, chiefly from the Texas Education Agency, as that body is responsible for the collection of student enrollment and financial data from every school district in the state of Texas. Other data sources included financial reports provided by the districts, either obtained directly or from the Internet websites of the school districts.

Student Enrollment

Every year, school districts in Texas are required under the Texas Education Code to capture student enrollment on a "snapshot day" in the fall semester of the school year. The TEA defines enrollment as "the number of students registered in a school at a designated time in the school year" (TEA, 2007, p. 1) and refers to students who are enrolled in early education through twelfth grade. The data, submitted to the TEA via the Public Education Information Management System (PEIMS), is used as the official enrollment of the school district for the year, despite changes that may occur in enrollment the remainder of the school year. This student enrollment figure is the basis for numerous costs per pupil figures used by the TEA as well as "vital statistics about the Texas public education system, such as student/teacher ratios" (TEA, 2007, p.1). The

data is collected and reported in the TEA's Academic Excellence Indicator System (AEIS) reports, available online at http://www.tea.state.tx.us/perfreport/aeis. All enrollment data used in the study came from the AEIS reports.

Actual Financial Data

As described in chapter one, the General Fund of a school district accounts for the majority of expenditures incurred in a school year. Therefore, the actual expenditure data used in this study represents expenditures accounted for only in the General Fund unless otherwise noted. The actual expenditure data used in the study is representative of the resource allocation patterns exhibited by the school districts in this study. The term 'actual' is used to denote the difference between budgeted financial data, as reported in the AEIS reports, and audited financial data. Audited financial data, or results of school year operations, was gathered mainly from the audited financial statement from each school district or from the TEA. Like enrollment data, the Texas Education Code requires every school district to submit audited financial data via the PEIMS. However, it was not until 2001 that the audited financial data was reported on the AEIS report.

The school districts in this study both produced a Comprehensive Annual Financial Report, or CAFR, for each year in the study. The CAFR is a financial document that incorporates into the audited financial statements more financial and statistical data and provides more information on expenditures than can be obtained from data reported on the AEIS reports. Both districts publish CAFRs on their respective websites and are therefore available for review to add depth to the data analysis. In cases

where the CAFRs were unavailable online, the districts were contacted and copies were secured from them directly.

Methodologies Used for Research Questions

Nachmias and Nachmias (1992) make reference to a form of data collection known as "unobtrusive measure" which they define as "any method of data collection that directly removes the researcher from the interactions, events, or behavior being investigated" (p. 302). As noted above, the data collected is historical in nature and colloquially "is what it is" and therefore meets the definition of an unobtrusive measure. What follows is a restatement of the research questions and the methodology used to address them.

How did resource allocation patterns change by major functional area as school districts lost or gained enrollment?

In order to address this question, each school year in the study for each district had an analysis performed on how resources were allocated at the major functional level. As described in chapter one, the function level details how school districts allocate resources by general, or major, operational area. It is this level of detail that is reported to the TEA via PEIMS, and was used to address the question of change. Ratio analysis was performed to determine the ratio of the various functional areas, or groups, to the total reported expenditures in the General Fund. Unlike Murray, Evans, and Schwab (1998) who studied the distribution of education resources after education-finance reform and deflated their expenditure data, this study used nominal expenditure data as the intent is to establish ratios of expenditures and not the relative purchasing power of

those educational resources. In addition, cost of education differences between districts due to the make-up of the student body were not taken into account.

What specific functional areas gained or lost resources as changes in student enrollment occurred?

Taking data from the results of research question one, specific functional areas were observed to determine how the shift in enrollment caused changes in these areas. Because specific functional areas can be tied back to school district operations such as basic instruction, library services, transportation and central administration, this analysis provides a more detailed picture of the changes in resource allocation patterns as a result of enrollment changes. Like the first research question, ratio analysis was used to derive these results using nominal expenditure data.

What categories of students gained or lost resources as student enrollment changed?

Easton (1993) reports on several studies on enrollment changes and the level of spending per pupil. The study by Odden and Vincent (cited in Easton) found that districts with declining enrollments over a four-year period spent more per pupil in the enrollment waning years than in higher enrollment years. The research by Cavin et al. (1985) was to determine if declines in enrollment actually contributed to the increases in costs per pupil. Not surprisingly, they found districts that experienced enrollment declines increased per pupil expenditures. Lankford and Wyckoff's (1995) analysis of expenditure allocation patterns of New York schools that experienced enrollment shifts found that over a ten year period, students classified as disabled garnered a larger share of resources, noting "increased expenditures for disabled students have important effects

on the allocation of resources" (p. 204). They further posit that the increases in expenditures for disabled students "may have come at the expense of nondisabled students" (p. 204). While the two former studies showed general trends in higher cost per pupil as enrollment decreases, they did so without addressing specific categories of students as the dependent variable to determine how enrollment affected changes in these categories. The Lankford and Wyckoff study did touch on specific student groups, but only so much as to define the students as disabled or nondisabled.

The TEA account code structure, as described in chapter one, allows for the recording of costs by specific instructional programs. Called the Program Intent Code (PIC), this code tracks expenditures by instructional program such as basic instruction, bilingual and special education. In all, PICs track six separate and distinct instructional arrangements. One of the PIC codes is further subdivided into three other categories, but for this analysis, these subdivisions were ignored. Data from each school district in the study was analyzed from a PIC perspective to determine how enrollment levels affected the allocation of resources to various categories of students. Ratio analysis provided the methodology to make this determination. As with most of the data presented in the study, this data has been presented in nominal form.

What was the effect of changing total enrollment on total expenditures per student in each of the two school districts?

Ultimately the macro view of a school district's financial operation, in relation to the delivery of instruction, comes down to how much was spent per pupil. The AEIS reports produced by the TEA include data on expenditures per student as does the

section in the U.S. Census Bureau's 2002 Census of Governments report on school expenditures (U.S. Census Bureau, [USCB], 2004). The basis of studies on the relationship between enrollment and resource allocation is cost per student (e.g., Monk, 1984; Cavin et al., 1985; Easton, 1993) as the calculation of that figure is relatively easy to determine. Because this study uses one independent variable, regression analysis was used to determine the relationship between changes in the independent variable and the resulting effect on the dependent variable, or cost per student for each district. Pedhazur and Schmelkin (1991) note the differences in using regression analysis for explanatory and predictive research. In this study, the results of the regression were used not for predictive purposes, but rather, as Pedhazur and Schmelkin comment "to use independent variables to explain dependent variables" (p. 371). They further note the distinction between using regression analysis and correlation models. Since all the data was analyzed using Microsoft Excel, the regression line and correlation coefficient can be calculated simultaneously as that program has the ability to do so. However, the correlation coefficient, in this case Pearson's Product-Moment, or *Pearson's r*, was used to help explain the variation around the regression line. That is, how well does a shift in enrollment explain the changes in costs per student?

Limitations

Given the nature of the research conducted, the study was limited by the following factors. First, others supplied the data as no direct observations were made. Each district in the study was responsible for following the TEA's mandated code structure to record expenditures. Given the multitude of expenditures incurred by each

school district over eight years and the necessity for administration to determine the "best" specific function and program intent code to use, it is possible that an identical expenditure incurred in each district was coded in a different manner.

Second, while student demographic data were listed for each district, these differences were not taken into account to explain overall resource allocations, nor were the inherent differences in instructional costs associated with various instructional arrangements.

Third, student enrollment figures were based on a single day's count. Both districts certainly had enrollment changes throughout the year that would have affected the results, especially if the districts continued to gain and lose students at the same rate they exhibited in each year of the study.

Lastly, because the sample size was limited to two school districts, the results found in this study may not necessarily be generalized to other Texas school districts. While the districts in this study are not atypical of Texas school districts, the results are unique to the variables included in the study and over the time period reviewed.

Summary

This study examined the relationship between changes in student enrollment and changes in how resources are allocated. These relationships were examined for two major urban school districts that occupy the same county in Texas and over an eight-year period had diverging student enrollment. The study's intent was to understand how changes in enrollment between two essentially coterminous school districts effect how resource were allocated within the districts. In addition, this study adds to the growing

area of research on the relationship between enrollment and resource allocation. To do this, relationships between increasing and decreasing enrollment and 1) changes in resource allocation patterns by major function, 2) changes in specific functional areas, and 3) changes in resource allocations to specific student categories were analyzed using comparison methods. The relationship between enrollment and expenditures per student used regression and correlation to determine the impact of enrollment on expenditures per student and how well changes in enrollment explain the change in expenditures.

CHAPTER FOUR

Results

This chapter presents the results of the data obtained in addressing the four research questions. However, before the questions are addressed, descriptive statistics will be presented for each school district in the study. The statistics presented will focus on student enrollment, categories of students, and total expenditures in the General Fund. Data for each of the eight years in the study will be presented. Since the General Fund is the fund that accounts for the majority of expenditures incurred by the school districts, it is the only fund used in this analysis. In addition, certain functional categories prescribed by the Texas Education Agency to record costs have been excluded from the analysis. Specifically, expenditures dealing with debt service, capital outlay and intergovernmental charges have been excluded, as their inclusion would distort the effects of trying to determine the cause and effect of enrollment and expenditures per student.

The next section of this chapter will address the first three research questions. The first three research questions addressed how resources were allocated in relation to changes in student enrollment over an eight-year period. That data will be presented in table and graph form, followed by an analysis of the findings. The tables and graphs allow for easy interpretation of changes in allocation patterns. Since the research questions dealt with how funds were allocated in relation to changes in student enrollment, percentages for each major and specific functional category will be expressed as a percentage of total General Fund expenditures for each respective year.

Financial data, unless otherwise noted, has not been adjusted by the Consumer Price Index (CPI), as each year stands alone and doing so would not alter the data results.

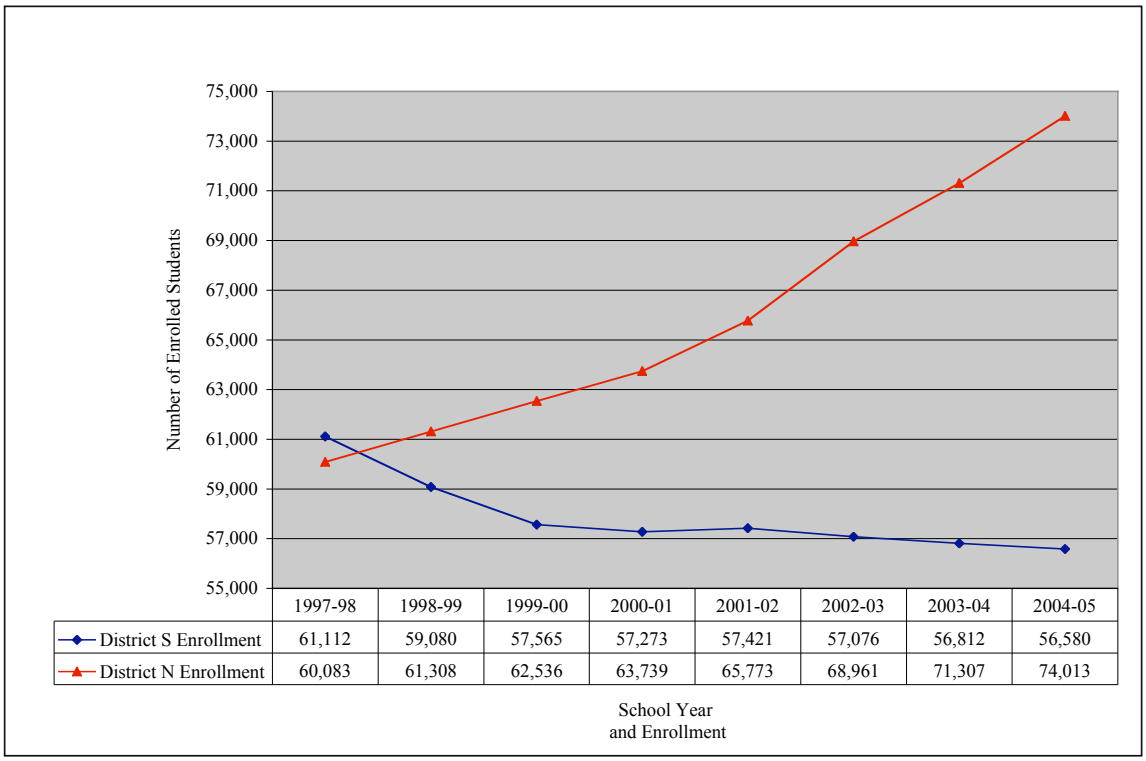
The final section of this chapter will address the results obtained for the fourth and final research question. Question four sought to determine how changes in enrollment affected costs per student. Unlike the data presented for the first three research questions, this data will be adjusted by the CPI. In addition, the CPI-adjusted data will be used to calculate a regression line to determine how well student enrollment explains changes in expenditures per-student.

Descriptive Statistics

Figure 2 depicts the basis for this study. Since the school year 1997-98 and through 2004-05, the number of students enrolled in each district has diverged in relation to each other. In the 1997-98 school year, the enrollment for District S was 61,112 while N's enrollments was 60,083. However, from 1997-98 through 2004-05, District S experienced a 7.4% decrease in enrollment while District N experienced a 23% increase in student enrollment, bringing student enrollment to 56,580 and 74,013 for districts S and N respectively. While the first year of the study starts with both districts having essentially the same student enrollment, it should be noted that at no other time did these districts have equal enrollment. It is precisely this reason why the time period used in the study was chosen. The time-period affords an opportunity to establish the respective districts' resource allocations in 1997-98 as a base year and analyze the changes in those resource allocations each successive year as enrollment increased or decreased. Setting the base year in 1997-98 in no way implies that year

represents optimal allocation of resources for each district. Nor is it assumed that each district will have similar patterns of resource allocations when student enrollment was the same.

Figure 2. Number of Enrolled Students by School Year for Districts S and N



	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
District S Enrollment	61,112	59,080	57,565	57,273	57,421	57,076	56,812	56,580
District N Enrollment	60,083	61,308	62,536	63,739	65,773	68,961	71,307	74,013

Tables 1 and 2 below present relevant data on each school district in the study, detailing total General Fund expenditures and numbers of students enrolled in specific instructional categories. The data in these tables will serve as the basis to address research question three.

Table 1. District S-Student and Financial Characteristics

School Year	General Fund Expenditures	Special Education Enrollment & Percentage of Total Enrollment	Career and Technology Enrollment & Percentage of Total Enrollment	Bilingual/ESL Enrollment & Percentage of Total Enrollment	Gifted and Talented Enrollment & Percentage of Total Enrollment	Economically Disadvantaged Enrollment & Percentage of Total Enrollment
97-98	$324,736,641	7,489/12.25%	7,528/12.32%	8,166/13.36%	3,395/5.56%	54,173/88.65%
98-99	$337,631,210	7,443/12.60%	8,327/14.09%	7,713/13.06%	3,341/5.66%	51,539/87.24%
99-00	$320,173,573	7,652/13.29%	8,146/14.15%	7,304/12.69%	3,368/5.85%	49,207/85.48%
00-01	$322,205,468	7,793/13.61%	4,694/8.20%	7,630/13.32%	2,834/4.95%	53,479/93.38%
01-02	$335,126,436	7,617/13.27%	8,494/14.79%	8,094/14.10%	3,212/5.59%	52,975/92.26%
02-03	$362,036,487	7,306/12.80%	7,999/14.01%	8,346/14.62%	3,190/5.59%	51,586/90.38%
03-04	$361,930,058	7,286/12.82%	10,682/18.80%	8,516/14.99%	3,063/5.39%	51,115/89.97%
04-05	$365,516,593	7,074/12.50%	10,563/18.67%	8,354/14.76%	3,231/5.71%	52,553/92.88%

The data in Table 1 illustrates that the percentage of students enrolled in special education, bilingual and gifted and talented classes remained fairly constant. Career and technology enrollment and students classified as economically disadvantaged (ED) showed modest increases (6.35% and 4.23% respectively). District S officials reported that starting in the 2003-04 school year, the Texas Education Agency categorized more classes as eligible for career and technology funding, allowing more students to be categorized as enrolled in those classes. In order to be classified as ED, a student must be eligible to receive free or reduced meals though the federal government's National School Breakfast and Lunch program. The criteria to be eligible, namely family income levels, and various economic factors have changed over the study's time frame. These changes are assumed to have contributed to the percentage changes in students classified as ED.

Over the eight-year period, the decline in District S's enrollment was 4,532 students. Over the same time period, expenditures increased by $40.8 million dollars.

Table 2. District N-Student and Financial Characteristics

School Year	General Fund Expenditures	Special Education Enrollment & Percentage of Total Enrollment	Career and Technology Enrollment & Percentage of Total Enrollment	Bilingual/ESL Enrollment & Percentage of Total Enrollment	Gifted and Talented Enrollment & Percentage of Total Enrollment	Economically Disadvantaged Enrollment & Percentage of Total Enrollment
97-98	$286,207,833	8,889/14.79%	6,641/11.05%	2,312/3.85%	5,239/8.72%	24,811/41.29%
98-99	$300,129,364	9,229/15.05%	8,336/13.60%	2,448/3.99%	5,234/8.54%	27,288/44.51%
99-00	$327,681,532	9,446/15.10%	8,853/14.16%	2,633/4.21%	5,198/8.31%	25,717/41.12%
00-01	$352,726,860	9,802/15.38%	9,390/14.73%	2,850/4.47%	5,145/8.07%	28,017/43.96%
01-02	$371,913,170	10,019/15.23%	11,672/17.75%	3,165/4.81%	5,248/7.98%	27,445/41.73%
02-03	$409,380,318	10,324/14.97%	11,755/17.05%	3,378/4.90%	5,387/7.81%	31,038/45.01%
03-04	$422,509,255	10,427/14.62%	14,788/20.74%	3,201/4.49%	5,635/7.90%	30,950/43.40%
04-05	$431,755,689	10,421/14.08%	14,918/20.16%	3,548/4.79%	5,946/8.03%	35,453/47.90%

The data for District N shown in Table 2 above show similar consistency to District S in the percentage of students enrolled in special education, bilingual and gifted and talented classes. Students enrolled in career and technology classes increased by almost 9.1%, showing the same increase in the 2003-04 school year as District S as a result of TEA's intervention. While District N showed a larger increase in students eligible for free and reduced price meals than did District S, District N still had less than 50% of its student enrollment eligible, indicating District N's more affluent community.

Indeed, data from the Texas Comptroller shows that in 2005, District N had property value in excess of $19 billion dollars while District S's property value was $8.5 billion. [6]

As expected, General Fund expenditures increased in conjunction with more students. However, unlike District S which only showed a 12.55% increase in General Fund expenditures, District N's increased almost 51%, certainly representing the enormous increase in costs associated with a 23% increase in students.

The data presented above gives a macro view of the two district's enrollment, percentage of students in specific categories, and spending patterns over an eight-year period. However, within General Fund expenditure totals are costs associated with various instructional, administrative and operational costs. These costs are accounted for with various major and detailed function codes and track how each school district spent its resources. These function codes, and the associated costs assigned to them, serve as the data set to address research questions one and two.

Enrollment and Resource Allocation

This section will present the results of the first three research questions. Expenditure data for major functions, specific functions, and categories of instructional programs and their percentage contribution to total General Fund expenditures will be compared to changes in total student enrollment. This comparison will look for relationships between these variables to determine how changes in student enrollment affected allocation patterns. An analysis will be made for each district separately.

[6] Data found at http://www.window.state.tx.us/taxinfo/proptax/pvs05fbook/pvs05f_3.html

Research Question One

How did resource allocation patterns in these two school districts change by major functional area as student enrollment changed?

District S

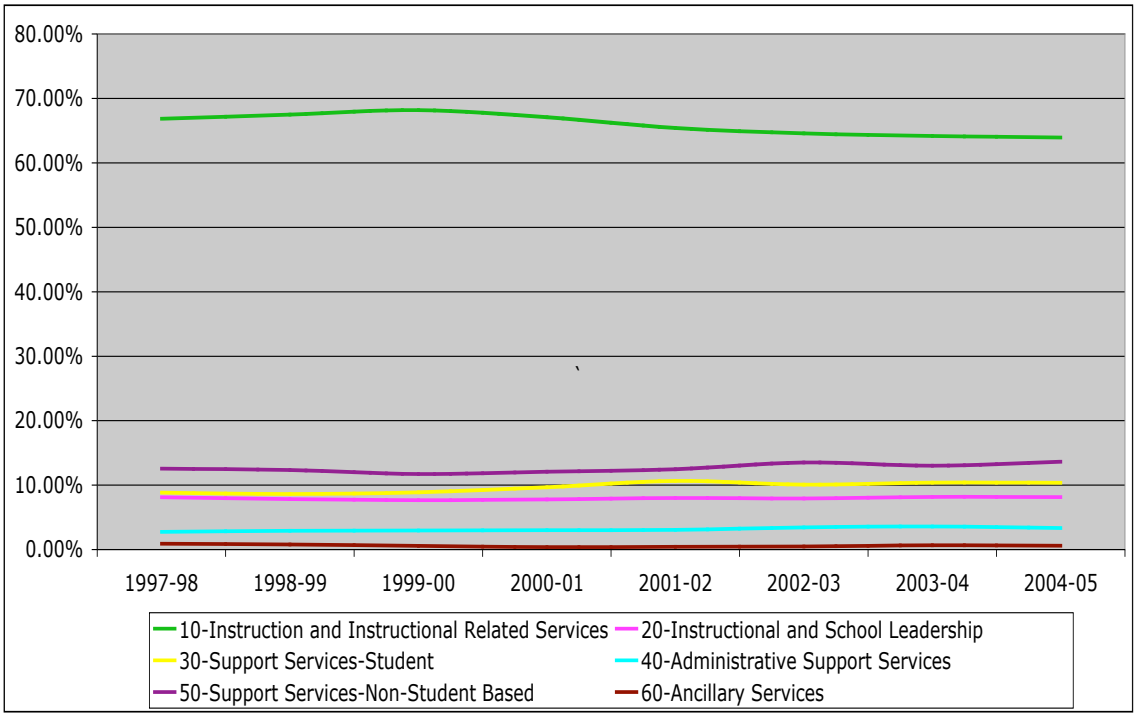
Table 3 and Figure 3 below present an overview of District S's expenditure allocations by major functional area. Table 3 presents major function data for each year in the study. The dollar amount each major functional area contributed to total General Fund expenditures is shown, as is the percent of total General Fund expenditures. The expenditure data has not been adjusted for inflation, as relative purchasing power of the various major functions is immaterial to addressing the research question.

Total General Fund expenditures increased by $40.8 million dollars from the school year 1997-98 to 2004-05. As indicated in Figure 3, expenditures for *Instruction and Instructional Related Services* (IIRS), the largest component of General Fund

Table 3. District S Major Function Expenditures and Percent of Total General Fund Expenditures

Major Function	1997-98	% of total	1998-99	% of total	1999-00	% of total	2000-01	% of total	2001-02	% of total	2002-03	% of total	2003-04	% of total	2004-05	% of total
10-Instruction and Instructional Related Service	$217,108,379	66.86%	$227,903,569	67.50%	$218,351,884	68.20%	$216,162,833	67.09%	$219,218,776	65.41%	$233,831,102	64.59%	$232,296,355	64.18%	$233,717,898	63.94%
20-Instructional and School Leadership	$26,348,946	8.11%	$26,407,637	7.82%	$24,541,147	7.66%	$25,060,399	7.78%	$26,791,730	7.99%	$28,672,552	7.92%	$29,562,819	8.17%	$29,770,385	8.14%
30-Support Services-Student	$28,683,207	8.83%	$29,111,629	8.62%	$28,441,596	8.88%	$31,140,818	9.66%	$35,654,295	10.64%	$36,436,714	10.06%	$37,590,644	10.39%	$37,819,768	10.35%
40-Administrative Support Services	$8,892,333	2.74%	$9,850,248	2.92%	$9,489,674	2.96%	$9,676,020	3.00%	$10,266,632	3.06%	$12,446,477	3.44%	$12,948,400	3.58%	$12,224,360	3.34%
50-Support Services-Non-Student Based	$40,763,740	12.55%	$41,675,140	12.34%	$37,488,647	11.71%	$38,915,722	12.08%	$41,718,003	12.45%	$48,891,711	13.50%	$47,070,387	13.01%	$49,820,924	13.63%
60-Ancillary Services	$2,940,036	0.91%	$2,682,987	0.79%	$1,860,625	0.58%	$1,249,676	0.39%	$1,477,000	0.44%	$1,757,931	0.49%	$2,461,453	0.68%	$2,163,258	0.59%
Totals	$324,736,641	100.00%	$337,631,210	100.00%	$320,173,573	100.00%	$322,205,468	100.00%	$335,126,436	100.00%	$362,036,487	100.00%	$361,930,058	100.00%	$365,516,593	100.00%

Figure 3. District S Major Function Percentages of Total General Fund Expenditures by School Year



expenditures, remained fairly consistent over the eight-year period, as did all major functional areas. However, interestingly, with the exception of IIRS and *Ancillary Services* (AS), which itself is not significant, all major functions increased as a percentage of General Fund expenditures. IIRS, which most closely tracks costs tied directly to students and instruction, as a percentage of total General Fund expenditures, decreased by almost 3%, reflecting the modest decrease in District S's student enrollment.

IIRS is subdivided into instruction, library and staff development expenditures. It follows then, that with a reduction in the number of students, those expenditures most directly associated with students and teachers would decrease as a percentage of overall expenditures.

Of the major functions that did increase as a percentage of General Fund expenditures, *Support Services-Student* (SS-S) had the largest increase at 1.52%. Included in this major function are detailed functions that capture expenditures related to guidance counselors, social work services, health services, transportation, food service and extra/co-curricular activities, although social work and food service are statistically insignificant.

Support Services-Non-Student Based (SSNSB) is the major function that contributed the second largest percentage of total General Fund expenditures. Over the eight-year period, this major function increased its contribution to overall expenditures to 13.63% in 2004-05 from 12.55% in 1997-98. While three detailed functions make up this major function, only one, maintenance, is relevant as it provides approximately 80% of the total cost of this major function. Like the major function rubric suggests, these costs are non-student based and therefore not directly tied to numbers of students.

District S Summary

In summary, the percent each major functional area contributed to total General Fund expenditures for District S remained consistent over the eight-year period in the study. District S's student population decreased by 4,532 students, causing little shift in how major functional expenditures were allocated.

Table 4. District N Major Function Expenditures and Percent of Total General Fund Expenditures

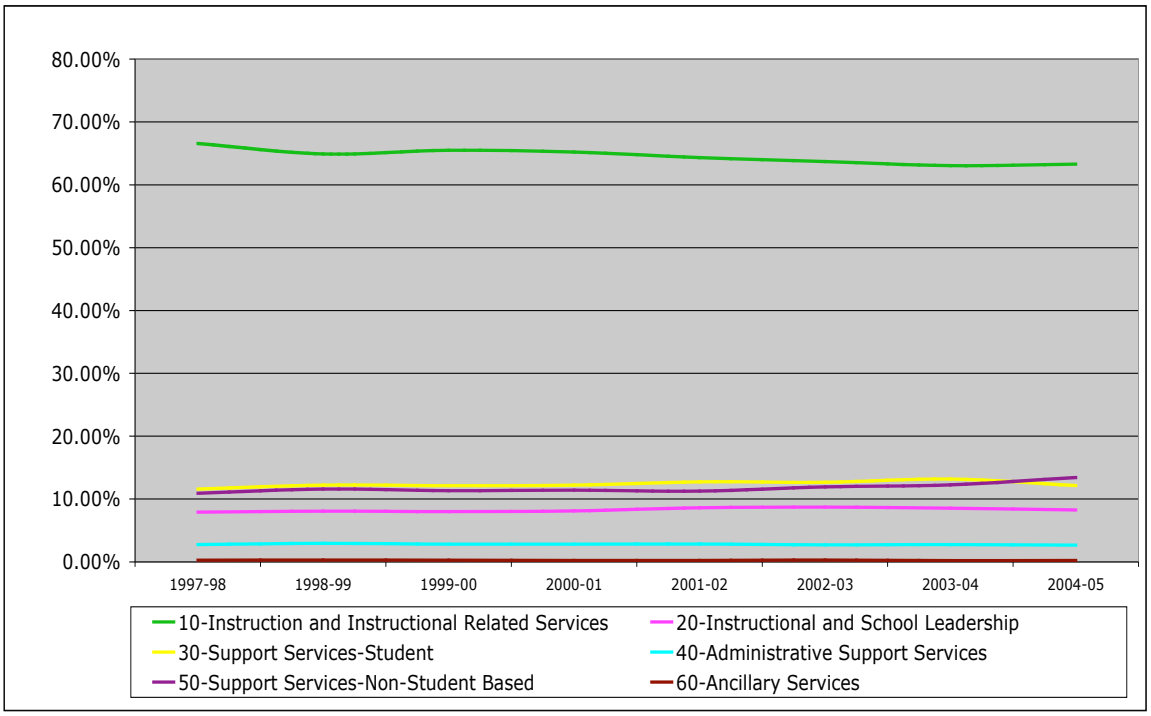
Major Function	1997-98	% of total	1998-99	% of total	1999-00	% of total	2000-01	% of total	2001-02	% of total	2002-03	% of total	2003-04	% of total	2004-05	% of total
10-Instruction and Instructional Related Service	$190,502,574	66.56%	$194,786,494	64.90%	$214,570,681	65.48%	$229,981,835	65.20%	$239,183,187	64.31%	$260,728,537	63.69%	$266,343,256	63.04%	$273,244,274	63.29%
20-Instructional and School Leadership	$22,620,883	7.90%	$24,189,510	8.06%	$26,172,823	7.99%	$28,589,784	8.11%	$32,017,521	8.61%	$35,642,450	8.71%	$36,062,240	8.54%	$35,657,525	8.26%
30-Support Services-Student	$33,137,536	11.58%	$36,638,538	12.21%	$39,712,453	12.12%	$43,082,893	12.21%	$47,364,612	12.74%	$51,792,362	12.65%	$55,699,678	13.18%	$52,422,214	12.14%
40-Administrative Support Services	$7,922,055	2.77%	$8,883,627	2.96%	$9,238,592	2.82%	$9,995,126	2.83%	$10,594,458	2.85%	$11,134,455	2.72%	$11,694,083	2.77%	$11,525,909	2.67%
50-Support Services-Non-Student Based	$31,212,045	10.91%	$34,737,068	11.57%	$37,062,421	11.31%	$40,226,037	11.40%	$41,863,652	11.26%	$48,864,080	11.94%	$51,754,464	12.25%	$57,892,758	13.41%
60-Ancillary Services	$812,740	0.28%	$894,127	0.30%	$924,562	0.28%	$851,185	0.24%	$889,740	0.24%	$1,218,434	0.30%	$955,534	0.23%	$1,013,009	0.23%
Totals	$286,207,833	100.00%	$300,129,364	100.00%	$327,681,532	100.00%	$352,726,860	100.00%	$371,913,170	100.00%	$409,380,318	100.00%	$422,509,255	100.00%	$431,755,689	100.00%

District N

Unlike District S, which experienced a modest decrease in student enrollment, District N had an increase in student enrollment of approximately 14,000 students. To determine the impact of this increase on major functional allocations, the same analysis applied to District S was performed for District N. Table 4 and Figure 4 below present an overview of District N's expenditure allocations by major functional area and are used to address research question one for District N.

Figure 4 below and Table 4 present data by major functional area for each year in the study. The dollar amount each major function area contributed to total General Fund expenditures is shown, as is the percent of total General Fund expenditures.

Figure 4. District N Major Function Percentages of Total General Fund Expenditures by School Year



Total General Fund expenditures increased by $145.5 million from the school year 1997-98 to 2004-05. Figure 4 shows that expenditures for IIRS, the largest component of General Fund expenditures, decreased as a percentage of total General Fund expenditures over the eight-year period. Of five major functional areas [AS excluded] two decreased while three increased, showing more variability in cost allocations than District S, which, when using the same major functional areas, had four increases and one decrease. The common decrease for District S and N was IIRS.

Instruction and School Leadership (ISL), SS-S, and SSNSB all showed increases as a percentage of total General Fund expenditures. While all three major functional areas showed increases, only the non-student based expenditures showed any real increase, with a 2.5% increase over the eight-year period. Other major functional

areas in the increase group showed very modest increases with growth rates of less than 1%.

While three major functional areas for District N showed decreases, only the aforementioned decrease in the instruction expenditures are relevant. The other major functional areas decreased a combined 0.15% as a percentage of General Fund expenditures, essentially contributing the same percentage in 2004-05 as they did in 1997-98.

District N Summary

In summary, the percent each major function contributed to total General Fund expenditures for District N remained fairly consistent over the eight-year period in the study, with no major functional area deviating more than 3.27%. District N's student population increased by 13,930 students, which accompanied a reduction in the amount spent on direct instructional and administrative expenditures, and an increase, if ever so slightly, on expenditures related to school leadership, student support services and non-student support services.

Summary of Findings for Research Question One

While District S and N experienced diverging student enrollment in relation to each other, they both increased expenditures in the major functional area that is most closely tied to students and instruction. However, as a percentage of total expenditures, both districts reduced the percentage spent on those areas. The remaining major functional areas together contributed no more than 40% of the remaining total

expenditures for either district. However there was more variability in how the districts allocated these costs in relation to changes in student enrollment.

Research Question Two

What specific functional areas in these two school districts gained or lost resources as student enrollment changed?

We have already seen how allocation of expenditures in major functional areas for districts S and N changed as enrollment changed. However, each major functional area is comprised of varying numbers of sub-functions that track costs at a more detailed level. In all, 16 specific function codes, referred to simply as functions, make up the six major functional areas. Thus, while a major functional area could have decreased as a percentage of total General Fund expenditures, the cost-behavior of the specific functions that comprise the major functional area may have actually increased as a percentage of total expenditures. While the analysis may show a specific function increasing in real expenditures, that increase may not necessarily imply a gain in resources since this analysis will use the percentage each function contributed to total General Fund expenditures to make that determination. That is, a higher percentage translates into increased resources and vice versa. Likewise, a comparison of percentage contribution to total expenditures between the first and last year in the study will be made to assess the impact of enrollment on expenditure patterns by functions, although any anomalous expenditure behavior in years two through seven will be noted where appropriate. Therefore, in addressing this research question, data for each specific

function will be presented in a fashion similar to the data presented in addressing the previous question. Table 5 below presents the data for both districts S and N.

District S

Three specific functions comprise (IIRS) and include functions 11-Instruction, 12-Instructional Resource & Media, and 13-Staff Development. While the major functional area IIRS accounted for an average of 66% of total General Fund expenditures over the eight year period, function 11 by itself accounted for over 62% of total General Fund expenditures over the same period. Moreover, function 11 represented an average of 94% of all expenditures incurred under the major function IIRS. While IIRS's percentage of total General Fund expenditures in 2004-05 decreased to 63.94% from 66.86% seven years prior, function 11 expenditures actually increased over $22 million.

Table 5. Specific Function Expenditures as a Percentage of Total General Fund Expenditures for Years 1997-98 to 2004-05

DISTRICT S

Specific Function	1997-98	% of total	1998-99	% of total	1999-00	% of total	2000-01	% of total	2001-02	% of total	2002-03	% of total	2003-04	% of total	2004-05	% of total
11-Instruction	$200,933,026	61.88%	$210,289,438	62.28%	$207,271,106	64.74%	$207,215,686	64.31%	$209,312,160	62.46%	$222,816,116	61.55%	$220,984,405	61.06%	$223,316,590	61.10%
12-Instructional Resource & Media	$7,208,976	2.22%	$8,217,656	2.43%	$7,221,897	2.26%	$6,764,521	2.10%	$6,666,211	1.99%	$6,854,787	1.89%	$7,018,834	1.94%	$6,475,678	1.77%
13-Staff Development	$8,966,377	2.76%	$9,396,475	2.78%	$3,858,881	1.21%	$2,182,626	0.68%	$3,240,405	0.97%	$4,160,199	1.15%	$4,293,116	1.19%	$3,925,630	1.07%
21-Instructional Leadership	$5,586,910	1.72%	$4,748,809	1.41%	$3,849,050	1.20%	$4,603,195	1.43%	$4,483,779	1.34%	$5,345,604	1.48%	$5,882,807	1.63%	$5,793,691	1.59%
23-School Leadership	$20,762,036	6.39%	$21,658,828	6.41%	$20,692,097	6.46%	$20,457,204	6.35%	$22,307,951	6.66%	$23,326,948	6.44%	$23,680,012	6.54%	$23,976,694	6.56%
31-Guidance & Counseling	$12,200,032	3.76%	$12,271,656	3.63%	$12,679,754	3.96%	$13,705,938	4.25%	$14,428,270	4.31%	$14,765,018	4.08%	$14,511,826	4.01%	$14,881,467	4.07%
32-Social Work	$1,119,215	0.34%	$1,376,315	0.41%	$1,089,047	0.34%	$1,291,684	0.40%	$1,379,754	0.41%	$1,688,997	0.47%	$1,799,319	0.50%	$1,837,441	0.50%
33-Health Services	$3,310,162	1.02%	$3,487,182	1.03%	$3,693,111	1.15%	$5,364,385	1.66%	$5,275,907	1.57%	$5,508,560	1.52%	$5,391,852	1.49%	$5,476,506	1.50%
34-Student Transportation	$5,648,590	1.74%	$6,001,192	1.78%	$5,288,492	1.65%	$5,271,323	1.64%	$6,736,538	2.01%	$6,116,728	1.69%	$7,166,399	1.98%	$6,892,818	1.89%
35-Food Services	$443,208	0.14%	$290,726	0.09%	$243,545	0.08%	$257,431	0.08%	$260,135	0.08%	$249,432	0.07%	$161,550	0.04%	$213,404	0.06%
36-Cocurr/Extracurr Activities	$5,962,000	1.84%	$5,684,558	1.68%	$5,447,647	1.70%	$5,250,057	1.63%	$7,573,691	2.26%	$8,107,979	2.24%	$8,559,698	2.37%	$8,518,132	2.33%
41-General Administration	$8,892,333	2.74%	$9,850,248	2.92%	$9,489,674	2.96%	$9,676,020	3.00%	$10,266,632	3.06%	$12,446,477	3.44%	$12,948,400	3.58%	$12,224,360	3.34%
51-Maintenance	$32,550,275	10.02%	$32,272,443	9.56%	$30,327,430	9.47%	$31,428,471	9.75%	$34,079,279	10.17%	$39,389,415	10.88%	$38,585,015	10.66%	$40,564,965	11.10%
52-Security	$5,095,946	1.57%	$4,759,241	1.41%	$4,623,383	1.44%	$4,799,570	1.49%	$4,872,590	1.45%	$5,068,747	1.40%	$5,063,382	1.40%	$5,407,927	1.48%
53-Data Processing	$3,117,519	0.96%	$4,643,456	1.38%	$2,537,834	0.79%	$2,687,681	0.83%	$2,766,134	0.83%	$4,433,549	1.22%	$3,421,990	0.95%	$3,848,032	1.05%
61-Community Service	$2,940,036	0.91%	$2,682,987	0.79%	$1,860,625	0.58%	$1,249,676	0.39%	$1,477,000	0.44%	$1,757,931	0.49%	$2,461,453	0.68%	$2,163,258	0.59%
	$324,736,641	100.00%	$337,631,210	100.00%	$320,173,573	100.00%	$322,205,468	100.00%	$335,126,436	100.00%	$362,036,487	100.00%	$361,930,058	100.00%	$365,516,593	100.00%

DISTRICT N

Expenditure Function	1997-98	% of total	1998-99	% of total	1999-00	% of total	2000-01	% of total	2001-02	% of total	2002-03	% of total	2003-04	% of total	2004-05	% of total
11-Instruction	$181,883,939	63.55%	$184,889,170	61.60%	$204,323,600	62.35%	$218,466,588	61.94%	$226,621,864	60.93%	$246,153,885	60.13%	$251,962,838	59.63%	$257,853,407	59.72%
12-Instructional Resource & Media	$5,529,054	1.93%	$6,685,012	2.23%	$6,565,791	2.00%	$6,911,959	1.96%	$7,276,474	1.96%	$8,505,790	2.08%	$8,062,419	1.91%	$8,342,284	1.93%
13-Staff Development	$3,089,581	1.08%	$3,212,312	1.07%	$3,681,290	1.12%	$4,603,288	1.31%	$5,284,849	1.42%	$6,068,862	1.48%	$6,317,999	1.50%	$7,048,583	1.63%
21-Instructional Leadership	$7,033,147	2.46%	$7,342,858	2.45%	$8,415,723	2.57%	$9,179,731	2.60%	$10,715,407	2.88%	$11,849,908	2.89%	$11,328,398	2.68%	$10,431,560	2.42%
23-School Leadership	$15,587,736	5.45%	$16,846,652	5.61%	$17,757,100	5.42%	$19,410,053	5.50%	$21,302,114	5.73%	$23,792,542	5.81%	$24,733,842	5.85%	$25,225,965	5.84%
31-Guidance & Counseling	$12,304,521	4.30%	$12,977,039	4.32%	$13,831,219	4.22%	$15,089,741	4.28%	$15,884,186	4.27%	$16,988,154	4.15%	$16,835,115	3.98%	$17,172,400	3.98%
32-Social Work	$966,074	0.34%	$1,014,329	0.34%	$969,829	0.30%	$1,156,813	0.33%	$1,149,890	0.31%	$1,238,793	0.30%	$1,224,780	0.29%	$1,161,709	0.27%
33-Health Services	$2,475,518	0.86%	$2,605,028	0.87%	$2,862,410	0.87%	$3,139,377	0.89%	$3,374,061	0.91%	$3,719,194	0.91%	$4,036,583	0.96%	$4,071,664	0.94%
34-Student Transportation	$11,890,898	4.15%	$13,732,602	4.58%	$15,399,181	4.70%	$16,732,936	4.74%	$19,598,677	5.27%	$21,330,493	5.21%	$24,882,927	5.89%	$20,662,970	4.79%
35-Food Services	$408,639	0.14%	$295,716	0.10%	$323,204	0.10%	$374,745	0.11%	$390,405	0.10%	$780,901	0.19%	$1,181,236	0.28%	$889,277	0.21%
36-Cocurr/Extracurr Activities	$5,091,886	1.78%	$6,013,824	2.00%	$6,326,610	1.93%	$6,589,281	1.87%	$6,967,393	1.87%	$7,734,827	1.89%	$7,539,037	1.78%	$8,464,194	1.96%
41-General Administration	$7,922,055	2.77%	$8,883,627	2.96%	$9,238,592	2.82%	$9,995,126	2.83%	$10,594,458	2.85%	$11,134,455	2.72%	$11,694,083	2.77%	$11,525,909	2.67%
51-Maintenance	$27,067,555	9.46%	$30,220,938	10.07%	$31,616,503	9.65%	$33,929,484	9.62%	$35,110,343	9.44%	$41,105,227	10.04%	$42,813,076	10.13%	$46,297,662	10.72%
52-Security	$1,982,799	0.69%	$2,101,387	0.70%	$2,277,273	0.69%	$2,351,355	0.67%	$2,434,854	0.65%	$2,969,931	0.73%	$3,527,783	0.83%	$3,523,136	0.82%
53-Data Processing	$2,161,691	0.76%	$2,414,743	0.80%	$3,168,645	0.97%	$3,945,198	1.12%	$4,318,455	1.16%	$4,788,922	1.17%	$5,413,605	1.28%	$8,071,960	1.87%
61-Community Service	$812,740	0.28%	$894,127	0.30%	$924,562	0.28%	$851,185	0.24%	$889,740	0.24%	$1,218,434	0.30%	$955,534	0.23%	$1,013,009	0.23%
	$286,207,833	100.00%	$300,129,364	100.00%	$327,681,532	100.00%	$352,726,860	100.00%	$371,913,170	100.00%	$409,380,318	100.00%	$422,509,255	100.00%	$431,755,689	100.00%

Thus, while direct instruction expenditures captured under function 11 were increasing, they did so at a rate that did not significantly change as a percentage of total expenditures, going from 61.88% in 2004-05 to 61.10% in 2004-05, implying that a reduction in student enrollment had little effect on District S's instructional spending, but the trend was downwards.

Functions 12 and 13 saw decreases in expenditures and a corresponding decrease in their percentage contribution to General Fund expenditures. Library expenditures decreased slightly as did their contribution to total expenditures. Staff development's percentage contribution dropped to just over 1% in 2004-05 when seven years prior it was close to 3%. Staff development's nominal expenditures decreased just over $5 million from 1997-98 to 2004-05, perhaps reflecting the decrease of 280 teachers over the same time period. Interestingly, the decrease in the number of teachers represents a 7.3% reduction in the teacher workforce and almost exactly matches the percentage reduction in the number of students enrolled over the same time period. Data from District S also indicate that in 1997-98, elementary, middle and high school campuses totaled 90, while in 2004-05, that number had dropped to 74, indicating that fewer teaching staff were required.

The eponymous functions under the major functional area ISL both had increases in expenditures, but only school leadership saw an increase in resources when measured by its percentage contribution to total expenditures. Even then, the increase was so modest as to represent less than two-tenths of a percent.

The major functional area with the greatest number of specific functions is SS-S. With six functions tracking costs as diverse as counseling, food service and extra and co-curricular activities, SS-S covers the widest range of expenditures that deal directly with student services. Despite covering such a wide range, the average percentage contribution each function contributed to total General Fund expenditures over the study's time period was 1.61% while the major function averaged just under 10%.

Guidance and counseling services, which contributed the largest percent of expenditures captured under SS-S, increased by roughly a quarter of a percent between 1997-98 and 2004-05, although during this time period this function showed a high degree of variability that did not seem tied to student enrollment. Increases in costs associated with guidance and counseling, especially in the year 2000-01, may have been the result of state legislation passed in 1999 that required all Texas school districts to increase the salaries of certain employees, namely teachers, librarians, counselors and nurses.

After guidance and counseling, transportation and extra/co-curricular expenditures both contributed the next largest percent of expenditures under SS-S. Transportation expenditures remained fairly consistent over the eight-year period, contributing an average of 1.8% to total General Fund expenditures. Extra/co-curricular expenditures, on the other hand, which contributed on average 2% of total General Fund expenditures, had double the increase of transportation expenditures over eight years and is reflected in the fact that, when measured as a percent of total expenditures, this function saw a gain in resources.

Of the remaining functions under SS-S, only Function 33-Health Services, contributed more than 1% percent to total expenditures, averaging 1.37% over eight years. Like the peak in expenditures seen in guidance and counseling, function 33 expenditures increased in 2000-01, bringing its percent contribution to total expenditures to 1.66%, the highest level reached over the eight-year period. This increase is ostensibly attributed to the aforementioned state mandated salary increase.

Only one specific function makes up the major function *Administrative Support Services*. Function 41 tracks costs associated with general administration, and is perhaps the lone function that is most disassociated with either services to students or student enrollment. The work by Anderson and Mark (1985) and Brewer (1996) showed that administrative expenditures have a tendency to either remain constant or actually increase as student enrollment decreases. Supporting this work, District S's administrative expenditures increased in nominal dollars between 2004-05, but more telling, also increased as a percentage of total expenditures for seven straight years, reaching 3.58% in 2003-04 and only slightly decreasing to 3.34% in 2004-05, the last year in the study.

The final major function of significance, (SSNSB), and its three functions is the only major function other than IIRS that consistently contributed more than 10% towards total expenditures. Like IIRS, SSNSB has one specific function that accounts for the majority of expenditures under the major function. Function 51 records maintenance expenditures and accounted for an average of 80% of all expenditures under SSNSB over the eight-year period. In addition, because the other two functions

included under SSNSB increased and decreased the same amount in percentage of total expenditures between the first and last year of the study, all percentage variability in SSNSB between the first and last year in the study is accounted for by function 51. The nominal dollar increase of $8 million dollars over the eight-year period translates into a percentage increase of over 1% towards total General Fund expenditures. Given the nature of the costs associated with this detailed function, namely the upkeep of facilities in the school district, it seems reasonable that this cost would increase as a percent of total expenditures since many buildings in District S are considered old. Like the major function rubric suggests, these costs are non-student based and therefore not directly tied to providing services to students, although an increase or decease in the number of enrolled students has an indirect effect on the behavior of these expenditures.

District S Summary

Table 6 below shows the major and specific functional areas for District S and the changes in percentage contribution to total General Fund expenditures between the first and last year of the study. Generally, District S tended to increase resources in administrative functions despite enrollment decreasing all but one year in the study. Functions 23, 31, and 41, generally considered the functions that track administrative expenditures, all experienced increases in resources both in dollar and percent contribution to total expenditures. Interestingly, Function 21, which tracks curriculum leadership costs, while marginally increasing its expenditures, saw a small decrease in resource allocation and is the only administrative function to do so.

As with the major function IIRS, the specific functions that make up this major functional area all saw decreases in resources, although direct instruction, accounted for

Table 6. District S Major and Specific Function Expenditures: Differences in Percentage of Expenditures in Relation to Total General Fund Expenditures for 1997-98 and 2004-05

Major Function	% Difference	Specific Function	% Difference
10-Instruction and Instructional related Services	-2.96	11-Instruction	-.78
		12-Library	-.45
		13-Staff Development	-1.69
20-Instructional and School Leadership	.03	21-Instructional Leadership	-.13
		23-School Leadership	.17
30-Support Services-Student	1.52	31-Guidance and Counseling	.31
		32-Social Work	.16
		33-Health Services	.48
		34-Student Transportation	.15
		35-Food Services	-.08
		36-Cocurr/Extracurr Activities	.06
40-Administrative Support	.06	41-General Administration	.06
50-Support Services NSB	1.08	51-Maintenance	1.08
		52-Security	-.09
		53-Data Processing	.09
60-Ancillary Services	-.32	61-Community Service	-.32

in Function 11, saw the smallest reduction in resources. Other functions associated with providing services to students such as health services, transportation and extra and co-curricular activities also generally increased in resources, but given the nominal increases, these are mostly attributed to salary increases and a general increase in the cost of procuring goods and services associated with the various SSNSB functions.

District N

Despite having only 1,029 students less then District S in 1997-98, District N spent approximately $26.6 million dollars less than District S in the major functional area IIRS. Nonetheless, the amount spent by District N represented 66.56% of total General Fund expenditures, almost exactly the same percentage District S spent, or 66.86%, for the same period. Thus, from a percentage basis, each district was allocating the same level of resources to the main instructional functional area. However, when viewed from a specific function level, differences appear. In 1997-98, District N allocated 63.55% of its total budget to Function 11 as compared to 61.88% for District S. While the nominal dollar difference shows District S spending more, District N allocated a higher percentage, and therefore, from this study's perspective, allocated more resources.

As expected, Function 11 expenditures increased every year, with some variability in how these expenditures contributed to total expenditures. While the general trend was downwards, in 1999-00 and 2004-05, the percent contribution increased from the prior year, although no year surpassed the contribution levels in 1997-98. Comparing the years 1997-98 and 2004-05, District N was contributing almost 4% less in instructional resources towards total expenditures despite an increase of almost 14,000 students.

Functions 12 and 13, rounding out the main instructional triumvirate, differed from Function 11 in expenditure behavior and allocation of resources. Function 12 did not increase expenditures every year, with two years actually seeing a reduction in

expenditures. This translated into a concomitant reduction in the percent contribution to total expenditures. However, Function 12 ended 2004-05 contributing the same percentage to total expenditures as it did in 1997-98, despite an increase in expenditures of $2.8 million dollars over the same period. Function 13, responsible for tracking teacher staff development costs, increased by .55% between the first and last year of the study. As with District S, this may be a result of the changing numbers of teachers on the payroll, as District N added 2,186 teachers between 1997-97 and 2004-05, a 56% increase and over twice the percentage increase in the number of enrolled students. Data from District N indicate 12 elementary, 2 middle and 2 high schools were added between 1997-98 and 2004-05. Despite the increase in teachers, resources devoted to staff development changed by approximately half a percent over eight years.

Function 21 expenditures and percent contribution to total expenditures both increased. However, the last two years of the study show a decrease in expenditures and a decrease in percent contribution. Expenditures in 2004-05 of $10.4 million meant this function contributed 2.42% to total expenditures, essentially identical to the level in 1997-98. Function 23, which represents costs associated with campus administration and the only other function under the ISL, also increased expenditures every year as well as its contribution to total expenditures. The increase in expenditures of $10 million dollars between 1997-98 and 2004-05 increased the percentage contribution to 5.84% from 5.45% seven years prior. While no data was available on the number of campus administrators employed, both increases are certainly reflective of the additional campuses and the resulting need to staff them.

The functions under SS-S, which are closely tied to students and the services provided to them, together accounted for a larger percentage of total expenditures than District S in 1997-98. This situation would remain throughout every year in the study. Function 31 was the second largest contributor of expenditures under SS-S and averaged 4.19% of total expenditures over the eight years in the study. Function 31's percent contribution remained relatively stable through 2001-02 but decreased in 2002-03 and stabilized at 3.98% the last two years. Other functions under SS-S, including Function 32-Social Work, Function 33-Health Services, Function 35-Food Services and Function 36-Co and Extra Curricular activities never contributed more than 2% of total expenditures in any year in the study. In addition, the percent contribution of each function was relatively stable and did not appear to be affected by increasing student enrollment, although three of the functions had slight increases between 1997-98 and 2004-05.

The function under SS-S that had the largest change in resources, both from a dollar amount and percentage contribution, was Function 34-Student Transportation. Not surprisingly, District N's expenditures for transportation far exceeded that of District S due to sheer size. Data reported by District N indicate the school district encompasses 355 square miles, whereas District S reports a 79 square mile area. Combined with a larger area and the fact that 16 campuses were added over eight years, transportation expenditures increased $8.7 million dollars from 1997-98 through 2004-05. However, the expenditures incurred in each intervening year translated into varying levels of allocated resources when seen from a percent to total expenditures perspective. Starting

with a 4.15% contribution in 1997-98, expenditures in 2003-04 represented nearly 6%, the highest level in the eight-year period, dropping over 1% in 2004-05 ending with a 4.79% contribution to total expenditures.

It is worthy to note Function 41 expenditures, if not for their level of contribution but for the expenditures they represent. The increase in nominal expenditures from 1997-98 to 2004-05 was $3.6 million. In 2004-05, the expenditures for general administration represented 2.67% of total General Fund expenditures, or one-tenth of a percent less than they did in 1997-98. Thus, while administrative expenditures increased, they maintained the same level of resources despite an increase in student enrollment.

The three functions under SSNSB all increased expenditure levels and are the only group of specific functions that all experienced an increase in resources. Function 51 expenditures increased to a level in 2004-05 that contributed 10.72% of total expenditures. Certainly the addition of 16 campuses and the associated maintenance contributed to this increase, as did the maintenance associated with older facilities. Function 52-Security and Function 53-Data Processing both had increases in resources allocated, though neither function is necessarily a function of numbers of students.

District N Summary

District N experienced a 23% increase in student enrollment between 1997-98 and 2004-05 with total expenditures increasing by $145.5 million over the same period. Table 7 below presents a summary of the major and specific functional areas for District N and the changes in percentage contribution to total General Fund expenditures as enrollment increased between 1997-98 and 2004-05.

District N decreased the amount allocated to direct instruction while slightly increasing the amount allocated for teacher staff development. Both are expected, given

Table 7. District N Major and Specific Function Expenditures: Differences in Percentage of Expenditures in Relation to Total General Fund Expenditures for 1997-98 and 2004-05

Major Function	% Difference	Specific Function	% Difference
10-Instruction and Instructional related Services	-3.27	11-Instruction	-3.83
		12-Library	0
		13-Staff Development	.55
20-Instructional and School Leadership	.36	21-Instructional Leadership	-.04
		23-School Leadership	.39
30-Support Services-Student	.56	31-Guidance and Counseling	-.32
		32-Social Work	-.07
		33-Health Services	.08
		34-Student Transportation	.64
		35-Food Services	.07
		36-Cocurr/Extracurr Activities	.18
40-Administrative Support	-.10	41-General Administration	-.10
50-Support Services NSB	2.5	51-Maintenance	1.26
		52-Security	.13
		53-Data Processing	1.11
60-Ancillary Services	-.05	61-Community Service	-.05

the ability to spread some fixed instructional costs over larger numbers of students and the additional costs associated with additional teachers. Surprisingly, District N saw little allocation movement in functions responsible for district-wide curriculum and campus administration despite the increase in campuses and students. Functions related to support services to students moved little as a whole, slightly more than half a percent,

but individually, as with Functions 32 and 33, saw little change, or increased by .64% such as function 34.

The main administrative function, 41, kept pace with student enrollment in that its allocation was always close to 3% of total expenditures, although in the last year of the study which had the highest enrollment, Function 41 experienced the smallest contribution at 2.67%.

The functions associated with support service functions that are not necessarily tied to student enrollment all saw allocation increases, and given that the school district became a larger organization, it was expected that these costs and allocations would increase. Maintaining more facilities, securing those facilities, and processing more data, both instructional and administrative, all require more expenditures that also increased the percent contribution for each of these functions.

Summary of Findings for Research Question Two

Both districts reduced resources to the largest specific functional area, although District N's large enrollment increase accompanied a much larger reduction than District S's smaller reduction of enrollment. The increase in enrollment for District N was followed by allocation increases, albeit minor, in areas such as school leadership, student transportation and activities deemed extra and co-curricular. A large increase of teachers, a natural by-product of higher enrollment, also translated into higher resource allocations for staff development.

District S matched District N in resource increases for 9 of the 16 specific functions analyzed. With a much smaller percentage change in enrollment, the effects on allocation of resources across specific functions were not as significant.

Research Question Three

What categories of students in these two school districts gained or lost resources as student enrollment changed?

The data presented for districts S and N on Tables 1 and 2 respectively in chapter one showed the number of students enrolled in four different instructional program areas and those classified as ED. Further, as described in chapter three, each program area's expenditures are tracked using a unique two digit program intent code (PIC) that is part of the TEA's mandated budget code. Table 8 below lists the codes and the instructional programs they track.

Table 8. List of Program Intent Codes and Areas Served

Program Intent Code	Instructional Program Area
11	Basic Education
21	Gifted and Talented
22	Career and Technology
23	Services to Students with Disabilities
24	Accelerated Education[7]
25	Bilingual Education and Special Language Programs

Using PIC expenditure data to address this research question, the expenditures made in each program area for every year of the study were reviewed in order to

[7] PIC 24 is commonly referred to as compensatory education, or simply "comp ed." Beginning in the school year 2002-03, PIC 24 was subdivided, adding five additional program intent codes. For purposes of this study, all will be combined to PIC 24.

determine how expenditure levels changed as enrollment shifted. For purposes of answering this question, the relative percentage contribution the expenditures made to total General Fund expenditures will determine if a program, and the student group served under the program, gained or lost resources. Only budgeted data was available for school years 1997-98 and 1998-99 for District S. Therefore, those years were excluded from the analysis. This will apply to District S only.

Some final notes to make regarding this analysis concern the inclusion of PIC 11 data and the enrollment figures for students classified as ED as listed on Table 1 and 2. First, expenditures made for basic instructional programs are coded under PIC 11. Because the TEA does not collect or report enrollment data for this program, enrollment figures for students served under this program were not included on Tables 1 and 2. However, Texas does recognize that a majority of enrolled students are served by instructional programs captured under PIC 11. Therefore, part of this analysis will correlate total enrollment with PIC 11 resource allocations. Another note to consider is that basic instruction enrollment cannot be interpolated by simply taking full enrollment and subtracting other given enrollment figures. Lastly, ED students are not served by just one instructional program. ED students do, however, generate compensatory education funding whose expenditures are tracked with PIC 24. Further, many of the students classified as ED also meet the various criteria to be served with compensatory education funding. Therefore, in lieu of an enrollment figure for PIC 24 compensatory education programs, enrollment of ED students will be used as a proxy.

Table 9 below presents the PIC data for both District S and N. The data presented is the percentage contribution each program area made to total General Fund expenditures.

Table 9. Program Intent Code (PIC) Expenditure Percent Contribution to Total General Fund Expenditures for School Years 1997-98 to 2004-05 for District N and 1999-00 to 2004-05 for District S

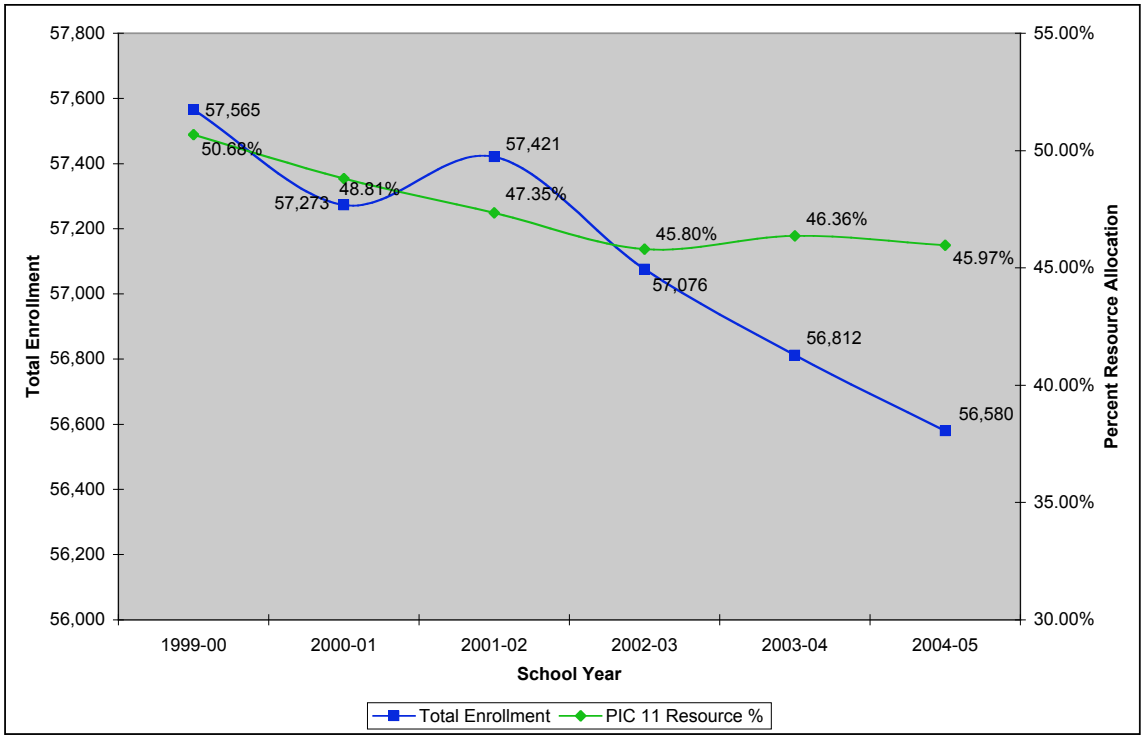
Program Area	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
Dist. S								
PIC 11	--	--	50.68%	48.81%	47.35%	45.80%	46.36%	45.97%
PIC 21	--	--	0.48%	0.44%	0.50%	0.43%	0.29%	0.53%
PIC 22	--	--	2.53%	2.57%	2.41%	2.33%	2.14%	2.11%
PIC 23	--	--	14.30%	15.01%	15.20%	15.00%	15.24%	15.20%
PIC 24	--	--	6.87%	7.73%	7.17%	8.23%	7.48%	7.51%
PIC 25	--	--	6.90%	6.81%	7.19%	7.25%	7.31%	7.45%
Dist. N								
PIC 11	44.45%	32.61%	53.22%	53.21%	53.96%	53.44%	53.71%	54.10%
PIC 21	0.86%	0.68%	1.17%	1.18%	1.19%	1.16%	1.08%	1.10%
PIC 22	2.46%	1.84%	3.01%	3.06%	3.04%	2.89%	2.64%	2.63%
PIC 23	13.17%	9.93%	16.18%	16.06%	15.78%	15.44%	15.74%	16.20%
PIC 24	3.80%	2.93%	4.99%	5.13%	4.35%	4.78%	4.22%	4.08%
PIC 25	0.44%	0.28%	0.45%	0.45%	0.27%	0.26%	0.22%	0.22%

District S

The largest contributor to total General Fund expenditures across all years in the study is PIC 11. PIC 11 expenditures reached $168,025,275 in 2004-05, the highest level in the study, but from a percent contribution perspective, the school year 1999-00 saw the highest relative expenditure level at 50.68%. Expenditures for basic services leveled-off after 1999-00 and represented an average of 46.86% of total General Fund expenditures. While there is no enrollment data for students enrolled in basic education programs, using total enrollment as a proxy indicates that decreasing enrollment

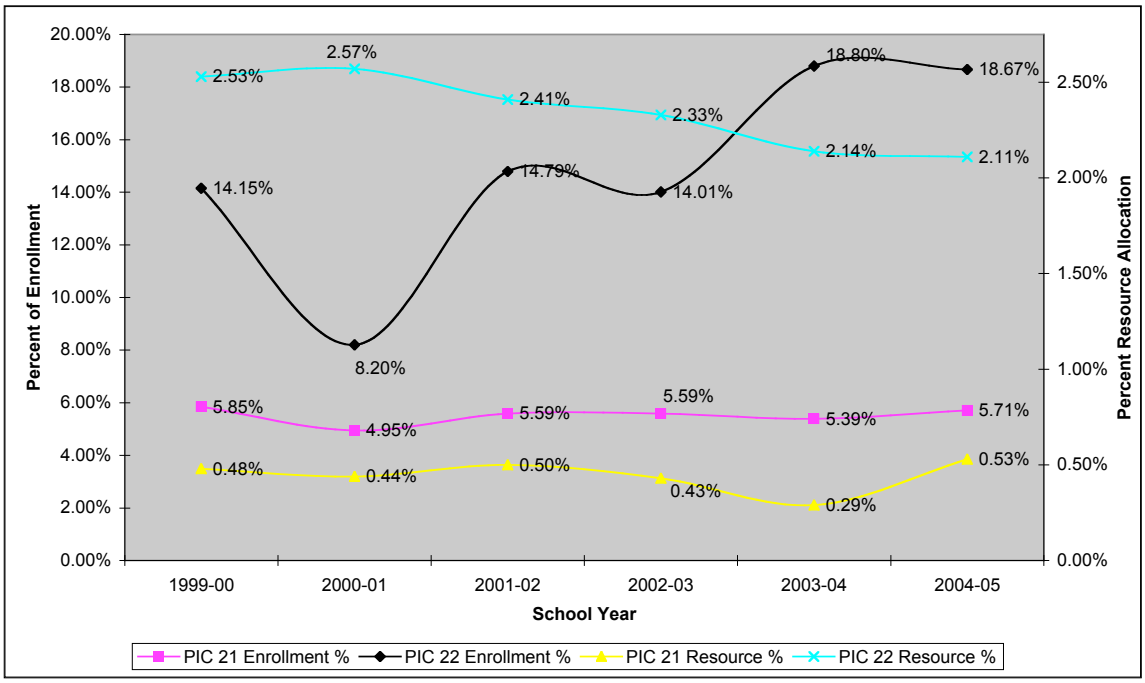
accompanied a decrease in resources for basic instructional services and the students who are served by this program. Figure 5 depicts this relationship.

Figure 5. Total Enrollment in Relation to PIC 11 Resource Allocations as a Percent of Total General Fund Expenditures for District S



PICs 21 and 22 together represented no more than 3% of total General Fund expenditures in each year of the study. With available enrollment figures for these two programs, we can compare the percent of students enrolled in each program in relation to total enrollment against the relative increase or decrease of resources when measured as a percent of total expenditures. Figure 6 below shows these relationships.

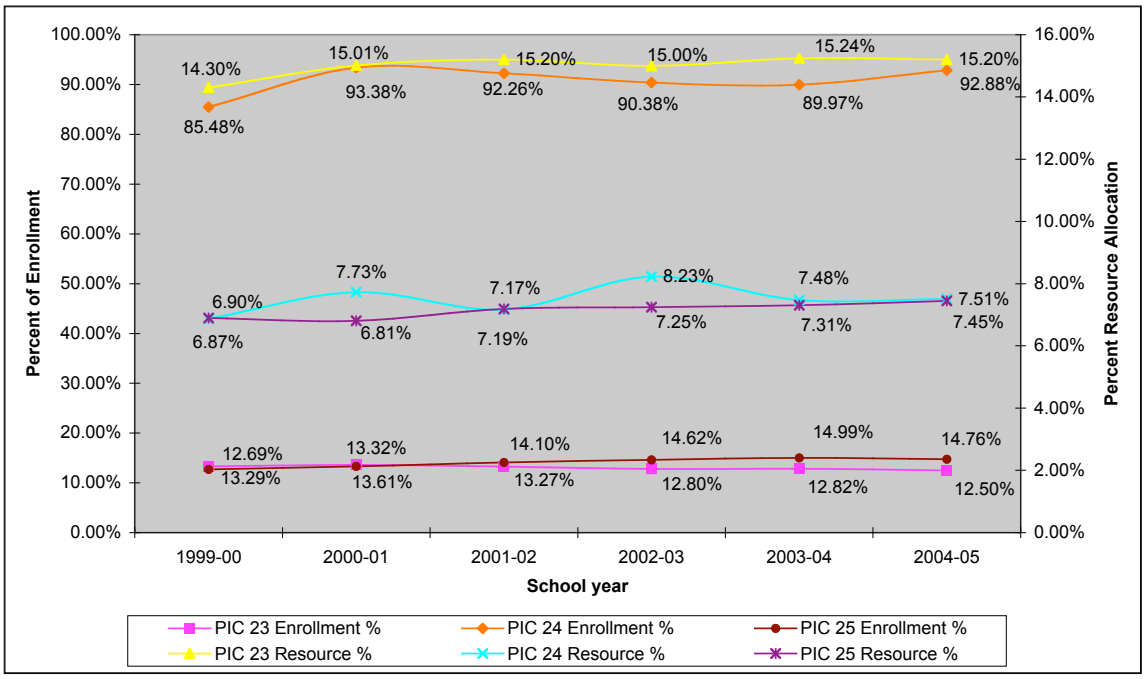
Figure 6. PIC 21 & 22 Percent of Enrollment Compared to Total Enrollment and Percent of Expenditures in Relation to Total General Fund Expenditures



PIC 21 enrollment was generally flat. However, expenditures showed a minor trend upwards, culminating with a .53% resource allocation in 2004-05, the same year PIC 21 expenditures reached their highest level. PIC 22 enrollment, despite an anomalous enrollment figure in 2000-01, increased both in numbers and percent of total enrollment, especially in the years 2003-04 and 2004-05. Interestingly these years represent the lowest total enrollment for District S. Also of interest are the resource allocations made to PIC 22. The highest resource allocations made to PIC 22, when measured by the percent of total expenditures, occurred in 2000-01, the same year PIC 22 enrollment had a precipitous drop. Because expenditures did not decrease accordingly, and because enrollment rebounded the next year to pre 2000-01 levels, coding errors in how students were reported are likely to explain this phenomenon. PIC

22 resource allocations showed decreases beginning in 2001-02 despite the aforementioned increases in enrollment and percent of total enrollment.

Figure 7. PIC 23, 24 & 25 Percent of Enrollment Compared to Total Enrollment and Percent of Expenditures in Relation to Total General Fund Expenditures



PICs 23, 24 and 25 together accounted for close to 30% of total General Fund expenditures per year over the eight years in the study. Figure 7 presents data for these PICs in the same manner Figure 6 did for PIC 21 and 22. PICs 23 and 25 alone provided more than 20% of total expenditures, while the students enrolled in PIC 23 and 25 accounted for approximately 25% of enrolled students. Students classified as ED account for 88% of enrolled students, although expenditures tracked by PIC 24 accounted for only 8% of total expenditures. As previously noted, PIC 24 expenditures, generated by students classified as ED, are not necessarily tied to programs serving

students classified as such. However, there is a strong relationship between students classified as "at-risk" and those classified as ED.

As a percent of total expenditures, PIC 23 expenditures showed an upward trend despite students enrolled in special education programs remaining relatively flat when viewed as a percentage of total enrollment. However, the actual number of enrolled students in PIC 23 decreased every year from 2000-01 to 2004-05. Special education program expenditures reached $55.5 million in 2004-05. Overall, students in special education programs benefited from an overall decline in student enrollment by receiving additional resources.

PIC 24 expenditures showed the same vacillations as did students classified as ED. As indicated on Table 9, expenditures for PIC 24 programs as a percent of total expenditures showed no consistency. Likewise, with an overall decreasing enrollment, the percentage of students who were classified as ED showed no consistent pattern. Given that being economically disadvantaged is incumbent on exogenous factors, namely being eligible for free or reduced priced school meals, the inconsistency in enrollment figures is to be expected.

PIC 25 nominal expenditures increased as a percentage of total expenditures while enrolled students served by those expenditures increased as a percentage of total enrollment. With overall enrollment decreasing, bilingual students served under PIC 25 gained resources.

District S Summary

District S experienced a decrease in total enrollment between the first and last year of the study. Most categories of students and their respective enrollments were fairly consistent when measured as a percentage of total enrollment. The exception was career and technology, which experienced the largest increase when measured as a percent of total enrollment.

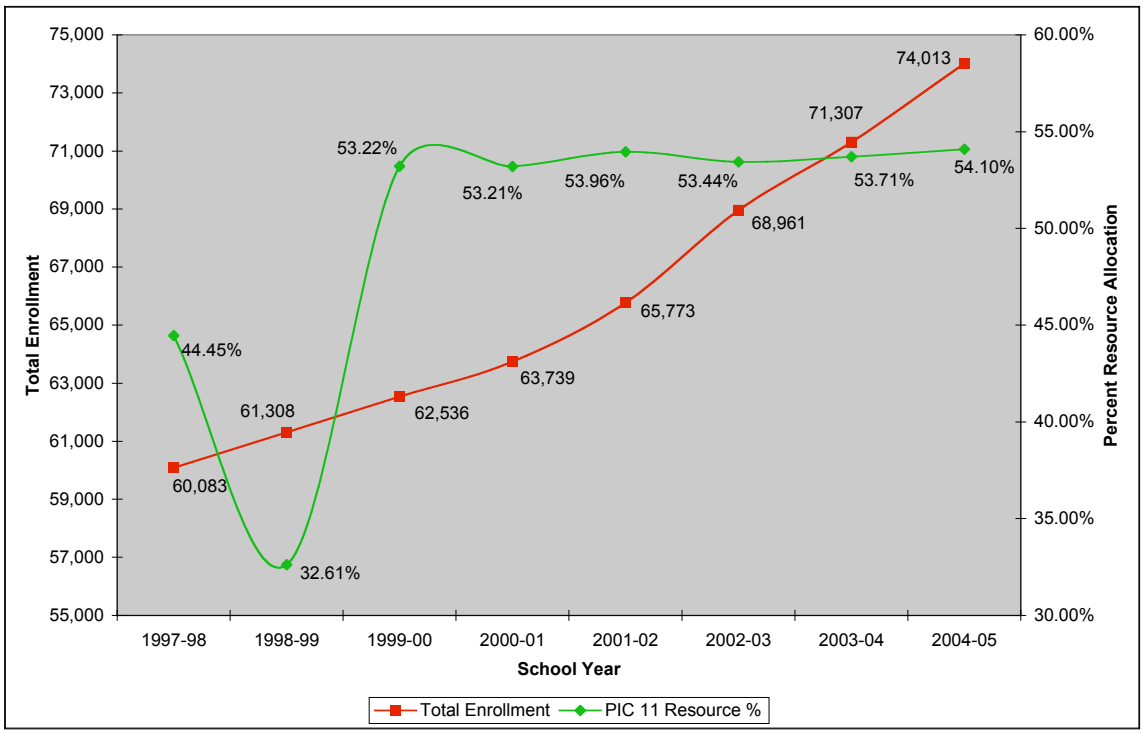
With a decreasing enrollment, the students served by PIC 11 programs, who represent the largest category of students, lost resources. Students enrolled in PIC 22 programs also lost resources as enrollment shifted. However, the number of students enrolled in these programs increased both in numbers and percent of total enrollment. Of the remaining four student categories, PICs 21 and 23 both had stable enrollment percentages and also gained resources. PIC 24 and 25 increased enrollment percentages and gained resources when comparisons are made between the first and last year of the study. No consistent pattern of resource allocation in relation to total enrollment could be seen in the years between, as was the case for most student categories.

District N

Like District S, the PIC in District N that contributed the largest percentage to total expenditures was PIC 11. In 1997-98, when enrollment was virtually identical for both districts and the disparity in total expenditures between districts was over $38.5 million, both districts allocated approximately 40% of total expenditures to PIC 11. However, as District N's enrollment grew, the percentage contribution also increased, reaching 54% in 2004-05, the same year the district had its highest enrollment. Figure 8

shows this relationship and indicates that by and large PIC 11 resources increased with increases in enrollment.

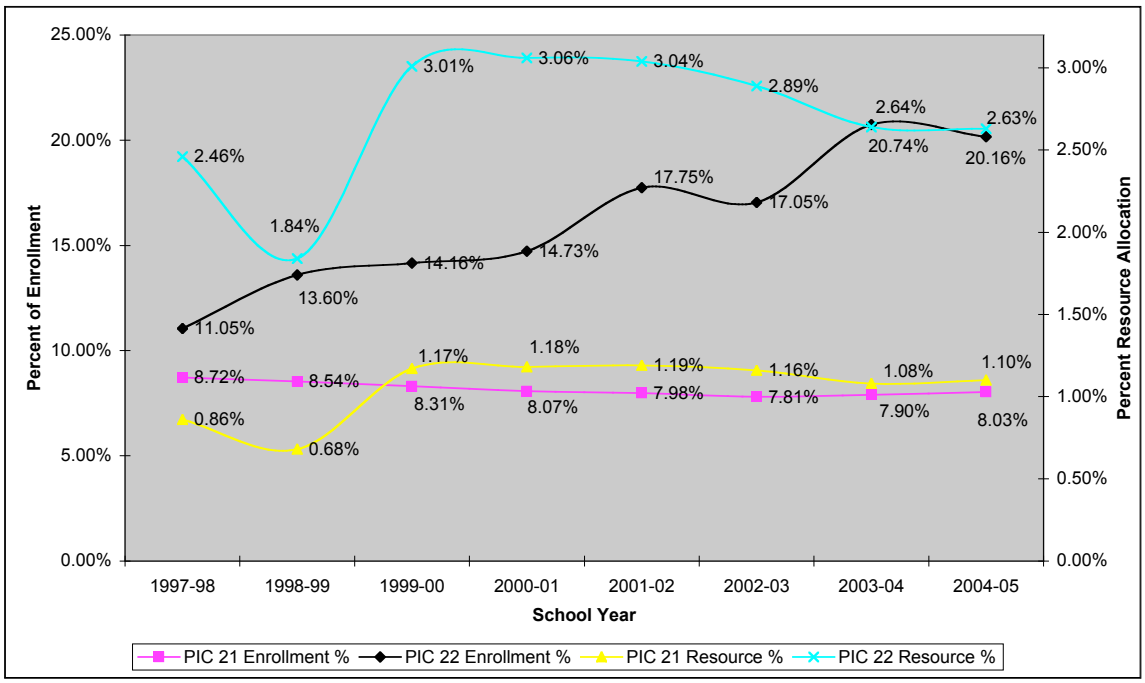
Figure 8. Total Enrollment in Relation to PIC 11 Resource Allocations as a Percent of Total General Fund Expenditures for District N



PIC 21 and 22 enrollment, assuming no overlap, accounted for an average of approximately 25% of enrollment for every year in the study, which is slightly higher than the same enrollment accounted for in District S. In addition, District N also averaged a higher resource contribution to these PICs than District S. With increasing overall enrollment, the percentage of students enrolled in PIC 21, as a percentage of total enrollment, decreased despite an increase in that program's enrollment. PIC 22 enrollment increased not only in numbers but in percent of total enrollment, more than doubling in enrollment and increasing to 20.16% of total enrollment in 2004-05 from

11.05% in 1997-98. Figure 9 below shows the relationship between enrollment and resource allocations for PICs 21 and 22.

Figure 9. PIC 21 & 22 Percent of Enrollment Compared to Total Enrollment and Percent of Expenditures in Relation to Total General Fund Expenditures

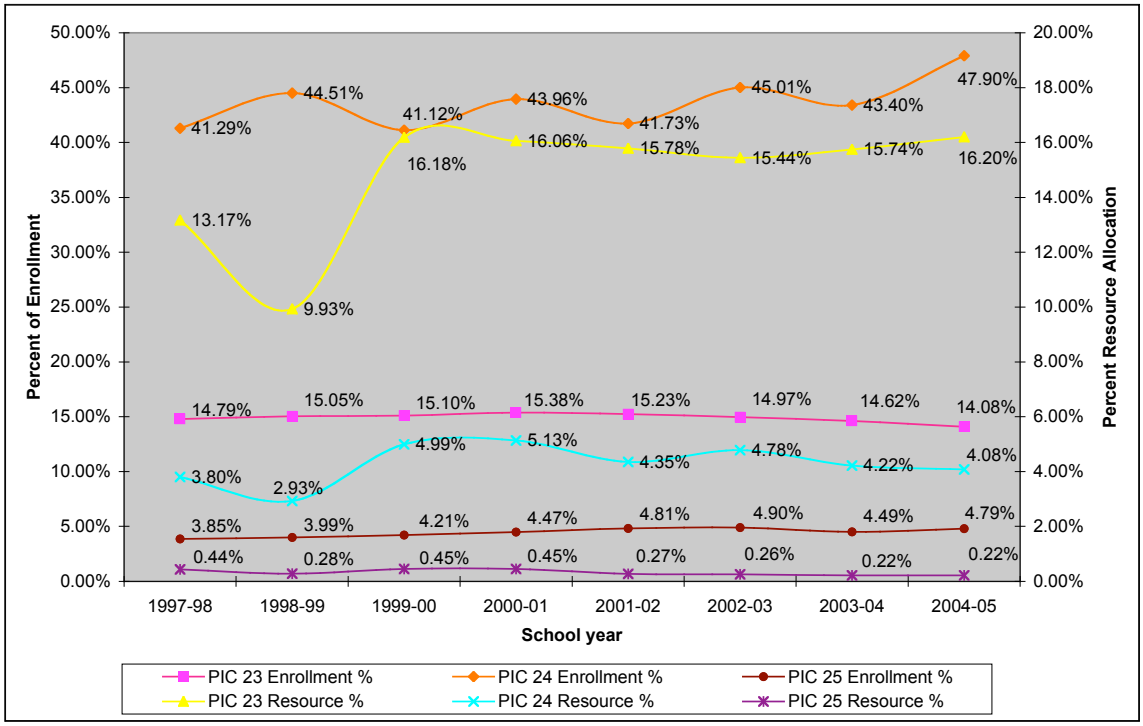


From a resource allocation perspective, the general trend for PIC 21 was a stable allocation of resources, especially between the years 2000 and 2005. PIC 22 resources, despite a large increase in enrollment and percent of total enrollment, actually experienced a decrease of resources. Figure 9 shows the almost inverse relationship between PIC 22 enrollment and resources allocated to that program. The linear relationship between PIC 21 enrollment and resource allocations for that program are also shown in Figure 9.

Unlike District S whose expenditures in PICs 23, 24 and 25 usually accounted for 30% of total General Fund expenditures, District N's expenditures in PICs 23, 24

and 25 accounted for an average of only 19% every year in the study. This follows given the different characteristics of students in each district. For instance, the students who comprise special education and bilingual enrollments account for roughly 20% of the total population in District N while, as previously noted, District S's population for the same group accounts for 25%. Bilingual enrollment percentages of S and N show a marked difference, but the most glaring difference in enrollment between districts rests with ED students. While District N's ED student enrollment reached 48% of total enrollment in 2004-05, at no time did the enrollment percentage for ED students in District S fall below 85%. While enrollment differences in various programs are a result of the demographic differences between districts, at issue is how the changes in total district enrollment affected the allocation of resources to the programs. Figure 10 below shows the relationship between enrollment percentages for PICs 23, 24 and 25, and the resources allocated to each program.

Figure 10. PIC 23,24 & 25 Percent of Enrollment Compared to Total Enrollment and Percent of Expenditures in Relation to Total General Fund Expenditures



PIC 23 expenditures increased by 48% from 1997-98 to 2004-05. Enrollment in special education programs also increased, but as a percent of total enrollment it exhibited a downward trend, especially after the 2001-02 school year. Resource allocations showed a slight downward trend starting in the 1999-00 school year. It was not until the second to last year of the study that resources increased slightly and ended 2004-05 at the highest allocation levels over the eight years. Increasing total enrollment coupled with a decrease in special education enrollment as a percentage of that enrollment had only a minor affect on PIC 23 resources.

PIC 24 expenditures exhibited a general trend downwards despite an increase in level of ED enrollment. While these two variables are not necessarily linked, there is an

expected correlation between students classified as ED and expenditures made for PIC 24 programs. From a resource allocation perspective, PIC 24 program expenditures reached a high of 5.13% of total expenditures in 2000-01 and began a general decline thereafter, mimicking the decline in nominal expenditures. Increasing total enrollment seems to have reduced the allocation of resources to ED students, despite an increase in both their total numbers and the percentage they contribute to total enrollment.

PIC 25 programs represent the lowest levels of expenditures in every year of the study, never exceeding $1.6 million dollars. The percentage contribution to total expenditures is also low, representing a fraction of one percent. This is in contrast to District S whose bilingual population exceeded N's in every year of the study and correspondingly represented a larger percentage of total enrollment. District N's bilingual population did increase in all years but one, and overall, averaged 4.43% of total enrollment. PIC 25 nominal expenditures remained relatively flat, but, as total expenditures increased substantially, PIC 25 expenditures accounted for less of the overall budget, representing an overall decrease of resources.

District N Summary

Over the eight years reviewed in this study, District N experienced a large increase in total student population. Expenditures associated with that large increase in enrollment show an expected increase as well, certainly in part because serving more students costs more, but also because of general inflation in costs associated with providing those services. The largest component of total expenditures tracked with a PIC, 11, showed that as enrollment increased, expenditures and resource allocations

increased as well. This is to be expected as the majority of students who make up the total enrollment are served with basic educational services.

No other categories of students fared as well from a resource allocation perspective, and of the remaining categorized student groups, three saw a decrease in resources as enrollment changed while two had stable resource allocations. Of the PICs that had fewer resources, all experienced increases in enrollment and represented larger shares of total enrollment in the last year of the study than in the first. Interestingly, PICs 21 and 23 lost enrollment as a percentage of total enrollment yet maintained relatively stable levels of resource allocations. Overall, it was basic instructional services and the students served by those programs that gained resources when enrollment increased. Other categories of students seemed to have gained resources if their percentage enrollments decreased, or lost resources if their percentage enrollments increased.

Summary of Findings for Research Question Three

From a PIC 11 perspective, the districts exhibited allocation behaviors indicative of the changes in total enrollment each district experienced. District S, with its decreasing enrollment, allocated fewer resources to PIC 11, the program that serves the majority of students. Conversely, District N, with its double-digit increase in student enrollment, allocated a higher percentage of resources to PIC 11. When various student groups are parsed, District N also showed characteristics of an increasing enrollment district in that most student groups lost resources when measured as a percent of total expenditures. District S demonstrated that with decreasing enrollment and increasing

expenditures, half of the categories of student expenditures tracked with PICs showed an increase of resources.

Enrollment and Expenditures Per Student

This section will address the final research question. To this point, we have seen how allocation of resources to various functional expenditures and student groups in both districts changed as enrollment changed. This was seen by comparing expenditures made in major and specific functional areas as well as in various instructional programs and calculating the contribution each made to total expenditures. Total expenditures were not used as a direct measurement in the first three research questions, but in question four, a comparison will be made between total expenditures and total enrollment. This comparison will determine how much was spent per student in each year of the study, and how a change in enrollment affected this figure. Unlike the first three research questions, an a priori assumption is made here that there will be an inverse relationship between levels of student enrollment and expenditures per student. Total General Fund expenditures will be adjusted for inflation.

Research Question Four

How did expenditures per student change as a result of changes in enrollment?

Table 10 below shows the inflation-adjusted expenditures per student for District S and N. In real dollars, District S actually decreased their overall expenditures between 1997-98 and 2004-05 by $23.5 million. In the years between, no pattern emerged that suggests a decline in expenditures as enrollment was decreasing, and in fact, in three years, expenditures actually increased from the prior year. Because of decreasing

enrollment, expenditures per student increased in those years as well. Overall, despite decreasing enrollment and decreasing real expenditures, District S spent more per student in 2004-05 than it did in 1997-98, validating the assumption that the relationship between decreasing enrollment and expenditures per student would be inverse.

Table 10. Inflation Adjusted Expenditures Per Student

School Year	District S	District N
1997-98	$6,366.77	$5,707.48
1998-99	$6,699.30	$5,738.77
1999-00	$6,308.06	$5,942.80
2000-01	$6,203.93	$6,102.63
2001-02	$6,335.91	$6,138.54
2002-03	$6,732.61	$6,300.98
2003-04	$6,586.50	$6,125.96
2004-05	$6,460.17	$5,833.51

District N, because of the large increase in nominal expenditures, did increase its real spending by $88.3 million between 1997-98 and 2004-05 when adjusted for inflation. In all years but one, real expenditures increased. Expenditures per student increased in years one through six, and decreased in year seven, the same year real expenditures decreased. As indicated on Table 10, District N spent more per student in 2004-05 than in 1997-98, although the last two years of the study, during which enrollment reached record highs each year, indicated a downward trend. This suggests

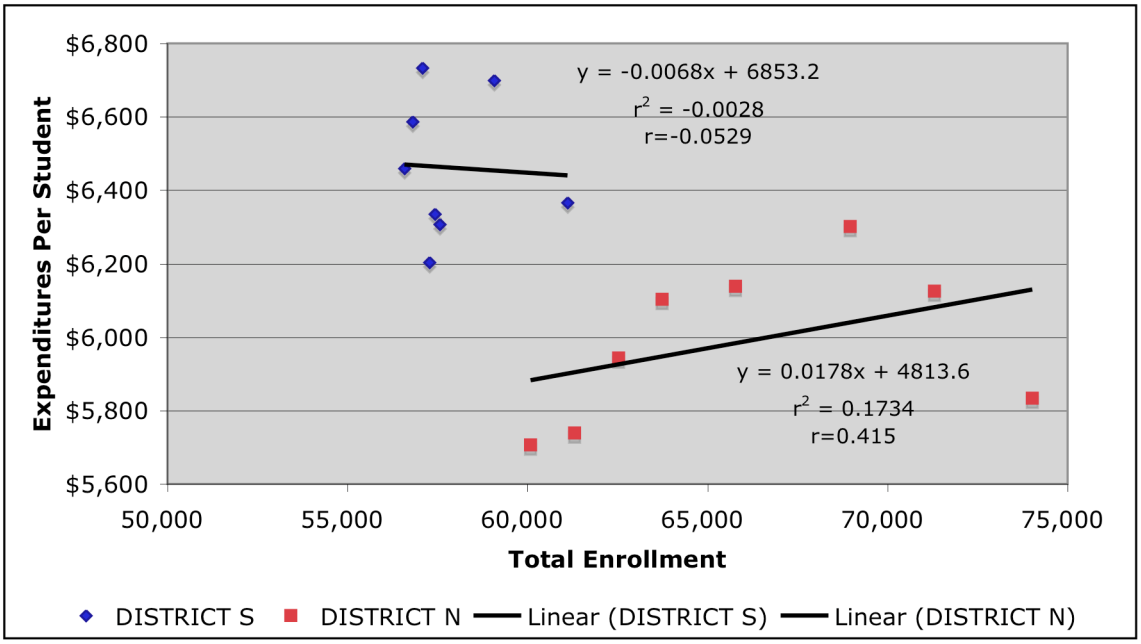
that District N reached a stage where continually increasing enrollments and increasing real expenditures would cause a reduction in expenditures per student.

Regression analysis

In order to determine how enrollment, the independent variable, explains the variances in expenditures per student, the dependent variable, simple regression analysis was used to derive a regression equation and a regression line. A correlation coefficient, *Pearson's r*, was also calculated. Nachmias and Nachmias (1992) note that "conventionally…Pearson's *r*, rather than r^2, is used as a coefficient of correlation" (p.397). The r^2 value is used to help explain how much of the variance in expenditures per student are accounted for by a change in enrollment. Figure 11 below shows graphically the relationship between enrollment and expenditures per student. *Pearson's r*, the regression equation and r^2 are also shown.

Using the calculated *Pearson's r* to determine how well enrollment and expenditures are correlated, District S shows a very weak negative relationship while District N indicates a stronger positive relationship. The r^2 values, an indication of how much variance in expenditures per student are accounted for by enrollment, indicate that District S's enrollment had little effect on expenditures per student. District N's enrollment accounted for more of the variance in that district's expenditures per student, but only 17.3% of the variance is accounted for by enrollment. Nonetheless, the positive direction of expenditures per student is counter to what was expected. Likewise, it was expected that District S's decrease in enrollment would cause a yearly increase in expenditures per student, although the results proved otherwise.

Figure 11. Regression Lines and Equations for Variables Enrollment and Expenditure Per Student for District S and N



Summary of Results

Allocations made to major and specific functional areas changed slightly for both districts as enrollment levels changed. Most telling, resource allocations made to those functional areas most directly tied to providing instruction decreased in both districts. Specific functions, used to track expenditures at a more detailed level, showed more variability in resource allocations than the larger, major functional areas, and provided more insight into how enrollment affected resource allocations. For instance, staff development expenditures moved in sync with the numbers of teachers employed, with the number of teachers being a direct result of enrollment levels. The various student groups tracked in each district exhibited resource allocation patterns suggestive of the direction their district's total enrollment was moving. The largest group of students in

each district received resource levels that mimicked enrollment levels, suggesting a direct, positive relationship between enrollment and basic instruction expenditures. Smaller groups of students exhibited inverse relationships between overall enrollment and resource allocations, suggesting that, irrespective of their own enrollment levels, increasing, or decreasing, levels of enrollment will decrease, or increase, their resource allocations. Finally, the regression calculations indicate total General Fund expenditures per student only marginally validated the assumption made that there would be an inverse relationship between enrollment and expenditures per student. While District S did increase its expenditures per student between the first and last year of the study, the intervening years' expenditure levels per student were contrary to the assumption. District N, with its 23% increase in students, showed only a decrease in expenditures per student the last two years of the study, suggesting a trend that would support the assumption.

CHAPTER FIVE

Discussion and Analysis

This chapter provides a discussion of the results detailed in chapter four. The discussion will involve an analysis of the findings as they relate to the relationship between student enrollment and resource allocations. Lastly, both implications of the research and limitations of the study will be discussed.

Overview

This study was designed to look for relationships between student enrollment and both resource allocations and expenditures per student in two Texas school districts. The two school districts were chosen because of their own unique relationship. In the 1997-98 school year they had almost identical student enrollment, and since that time have diverged in total enrollment. Both school districts are defined by the TEA as major urban and are located in the same county, in the same major metropolitan area and share portions of their district boundaries. While numerous studies have been performed to look for relationships between enrollment and student achievement, resource allocations and student achievement, or expenditures per student and student achievement, fewer studies have used enrollment as a variable to explain both resource allocation patterns and expenditures per student. Budget maximization theory was used both as a backdrop on which to frame the study and, possibly, as an explanation for the results found. This study adds to the growing research of how school districts cope with changes in student enrollment from a resource allocation and cost per student perspective.

Enrollment and Resource Allocation

Whether the work of the mythical budget-maximizing bureaucrat is at work seems inconclusive based on the results of the study. Over the eight years reviewed, District's S and N diverged not only in the number of enrolled students but also in real expenditures incurred. District S, with a reduction of 4,532 students, decreased inflation-adjusted expenditures by almost $24 million. District N, on the other hand, saw increases of 13,930 students and $88.8 million in real expenditures. The direction of expenditure levels in relation to levels of student enrollment seem reasonable[8] if one subscribes to the notion that school districts need resource levels to move in the same direction as enrollment. However, when looked at from a dollar change per student, a somewhat different picture emerges and gives pause to reconsider if the bureaucrat's work is at hand.

Between 1997-98 and 2004-05, District S decreased real expenditures by $24 million. This represents $5,200 for every student lost in total enrollment. District N increased expenditures by $6,377 per newly enrolled student. From this one can surmise that District S is decreasing expenditures at a slower rate than District N is increasing expenditures. Could this be because District S is attempting to maximize its budget despite the pressure to reduce resources? Table 11 below shows that District S did not reduce resources per student at the same average rate they spent per student. District N increased resources at a higher level than the average spent per student over the eight years reviewed. In other words, each is exhibiting budget-maximizing behavior. The

[8] Inflation-adjusted expenditures did not always move with enrollment levels.

analysis performed on how these districts allocated resources to general and specific function, as well as to various student groups, due to changes in enrollment provided more detailed explanations of the resource allocation patterns exhibited by these districts.

Table 11. Real Expenditure Changes Divided by Changes in Enrollment Per Student Compared to Average Expenditures Per Student

	District S	District N
Increase (Decrease)	($5,200)	$6,377
Average expenditures from 1997-98 to 2004-05	$6,462	$5,986

Both Districts S and N allocated fewer resources to the general function area that includes the majority of instructional expenditures. However, District N reduced resources to this major functional area to a higher degree than did District S despite N increasing enrollment at a faster rate than S decreased enrollment. While the changes in instructional resources allocated by both districts changed by small percentages, District S exhibited behavior reminiscent of what Easton (1993) found in his study of Oregon schools where more was spent per student as enrollment decreased.

When other major functional areas are compared, neither district showed any consistency in allocation of those resources in relation to the direction of enrollment. This is most apparent when a comparison between 1997-98 and 2004-05 is made. Many general functional categories in both districts received essentially the same level of resources in the first year of the study as they did in the last. The years between showed

higher degrees of variability, sometimes moving in opposite directions of enrollment. These variations could have been caused by internal administrative decisions based on needs of students, or external factors such as state legislative action mandating pay increases. Another factor to consider is the possibility that the districts reacted slowly to changes in levels of student enrollment (Cavin et al., 1985; Edelman and Knudsen, 1990) and administration needed more than one school year to find equilibrium of resource allocations.

Specific functions also showed greater variability in intervening years than between the first and last year of the study. The 16 specific functions that comprise the six major functions provided greater detail for resource allocation analysis. For instance, while both districts decreased resources to the major instructional function, the three specific functions that comprise the major function and the direction of their resource allocation percentages provide a clearer picture of how changes in enrollment affected allocations. The allocations to the specific function responsible for capturing the majority of instructional expenditures, Function 11, decreased in both districts between 1997-98 and 2004-05. More telling, however, is to what extent enrollment changes had on this function. For instance, Function 11 in District S decreased by less than 1% while District N decreased by almost 4%. However, the major function analysis showed each district reducing the major instructional category by approximately 3%. Other specific functions such as Function 13, which is also part of the major instructional function, Function 31, Function 34 and Function 41 showed greater variability in years 2 through 7 of the study than is indicated in a comparison between the first and last years.

With the limited availability of staff data from either the TEA or the districts in the study, it was difficult to make any comprehensive staff to expenditure comparisons. However, data for the number of teachers were available from the TEA. Function 13, as noted in a previous chapter, had allocation of resources that seemed to follow the increase, or decrease, in the number of teachers in each district. Function 41 expenditures, being the function most heavily associated with a district's administrative "overhead", showed the classic allocation pattern of decreasing as a percentage of total expenditures in the district with increasing enrollment and increasing, if ever so slightly, in the district with decreasing enrollment.

Though there were hints of relationships between some specific functions and enrollment, the analysis of major and specific functions did not reveal any significant relationship between enrollment and resource allocations. While real expenditures increased and decreased in the same direction as enrollment, this had no bearing on how enrollment affected resource allocations to the six major and sixteen specific functions.

Enrollment and Allocations to Students

The TEA distributes dollars to all Texas school districts based on, among other things, the number of students enrolled in various instructional programs. The expenditures incurred for these instructional programs are tracked with program intent codes, or PICs, that are part of the larger mandated TEA budget code. These PICs were used in this study to determine how changes in enrollment affected the distribution of resources to these programs and the students who are served by them. While the analysis was a comparison between total enrollment changes and the effect on PIC resource

allocations, enrollment numbers were available for most of the instructional programs that allowed for another dimension to be included in the analysis.

District S, with its declining total enrollment, had every instructional program's enrollment contributing a larger percentage of total enrollment. This is due to the fact that enrollment levels in each program changed very little. Resource allocations to every student category tracked with a PIC increased when a comparison is made between the first and last year of the study. However, like general and specific functions, the variability in the intervening years shows no consistent pattern. One caveat to this is that budgeted data was used for District S in years 1 and 2 of the study. While PIC 11 expenditures showed an increase in resources between the first and last year of the study, it could be that the downward trend in years 3 to 8 was in fact the dominant trend beginning in year 1.

The districts have no control over student enrollment. More control is available to determine where students are placed instructionally, and even more control is available to determine how resources will be spent and coded. The decreasing enrollment in District S did little to affect enrollment in all but one instructional program, and even that was a matter of legislative action. The data indicate that as enrollment decreases, a student group that experiences an increase in percentage of total enrollment may lose resources.

On the other end of the enrollment spectrum, District N showed that increasing enrollment caused some student categories to contribute less to overall enrollment, a natural by-product if enrollment within those categories is relatively stable. Similar to

District S, resource allocations to student groups showed no consistent pattern in relation to total enrollment. With the exception of bilingual education, every student group saw increases in resource allocations between the first and last year of the study. However, the general trend in the intervening years was stable or increasing resources to student categories that decreased enrollment and decreasing resources for those that increased enrollment.

Resource allocations to various student groups in relation to changes in enrollment is an area rich for investigation. While the TEA code structure facilitates this investigation by requiring Texas school districts to code expenditures by instructional program, a review of the literature could find no analysis done specifically on the relationship between PIC expenditures and enrollment. The study by Alexander et al. (2000) did use PIC data, but as a measure of resources spent in relation to academic achievement, not enrollment. Reyes and Rodriguez (2004) do correctly note that categorical programs "are designed to address either a particular or targeted educational policy goal or the special needs of …student populations" (p. 11). In Texas, categorical funding for various student groups is an important part of that state's education finance formula. With spending requirements attached to those funds, how enrollment affects the distribution of those resources becomes a matter of importance to all school districts.

Enrollment and Expenditures Per Student

While the use of PIC data is a rich area for investigation, expenditures per student still remains the venerable barometer of how well a school district is doing, sometimes irrespective of achievement levels. It is only when achievement levels are

measured against expenditures per student that relationships are drawn to either decry that expenditures are mutually exclusive of achievement, or to advocate that more resources are needed to increase student achievement. While that debate rages, how enrollment affects expenditures per student has been researched (Monk, 1984; Bowles & Bosworth, 2002) and the patterns exhibited by the districts in the study indicate results different from those research studies and from what was expected.

Cavin et al. (1985) found that districts with enrollment changes reacted slowly to adjusting expenditures. As such, in the case of a district that lost 20% of enrollment over a two-year period, expenditures per student increased in the short-term, and after resource adjustments were made, expenditures returned to levels that were at levels only 10% more than before enrollment increased. Conversely, they found that districts that increased enrollment initially saw a decrease in expenditures. Tables 12 and 13 below show the relationship between the percentage change in student enrollment and percentage change in inflation-adjusted expenditures per student for districts S and N respectively.

Neither district showed double-digit changes in student enrollment per year but did show similarities to what Cavin et al. found in their study. District S, for instance, increased per student expenditures by 5.22% the year they experienced a 3.33% decrease in enrollment. However, District S seemed to react quickly reducing expenditures by close to 6% the next year, the same year they lost another 2.5% in enrollment.

Subsequent years, which never saw a decrease in enrollment of more than 1%, showed expenditures per student increasing and decreasing with no relationship to enrollment. The regression analysis performed supports this.

Table 12. Percentage Change in Enrollment and Expenditures Per Student for District S

School Year	% Change in Enrollment	% Change in Expenditures
98-99	-3.33	5.22
99-00	-2.56	-5.84
00-01	-0.51	-1.65
01-02	0.26	2.13
02-03	-0.60	6.26
03-04	-0.46	-2.17
04-05	-0.41	-1.92

Table 13. Percentage Change in Enrollment and Expenditures Per Student for District N

School Year	% Change in Enrollment	% Change in Expenditures
98-99	2.04	0.55
99-00	2.00	3.56
00-01	1.92	2.69
01-02	3.19	0.59
02-03	4.85	2.65
03-04	3.40	-2.78
04-05	3.79	-4.77

District N increased enrollment by an average of 3% every year in the study. Expenditures per student in years 2 and 3 increased at rates higher than enrollment but quickly leveled off in year 4. While District N increased expenditures per student in every year but two, those two years came in years 7 and 8 and seem to indicate that

expenditures had reached a level that would translate into further yearly reductions in costs per student.

Neither district exhibited expenditure per student patterns that were consistent with research findings in the literature or the assumptions made in this study. Surely, many variables were involved in each district's decision to alter levels of expenditures, some of which were not, and could not, be included in this study's analysis. To do so would have altered the nature of the study and added many different levels of complexity that may not have added to the results found.

Implications for Research

Expenditures per student is one of the dominant narratives in education finance research. It is one of the easiest measures to calculate and can speak volumes when used in conjunction with an already developed theory of how expenditures per student impact student achievement. The data can support both the notion that more resources are necessary for increases in student achievement or that it is a matter of how existing resources are used that has the greatest effect on achievement. Policy makers are keen to use the data to develop policies that support a position that is politically palatable at the time. Chapter two detailed both sides of the expenditure per student argument but also covered other areas of research, such as how enrollment affects expenditures and achievement that go beyond the simple measure of cost per student. Nonetheless, the venerable cost per student analysis is still dominant as are most measures based on inputs of resources rather than outcome-based measures.

States such as Texas and Ohio have devised systems that measure more than just expenditures per student. With complex systems that record costs almost down to the classroom level, it is no longer necessary to interpolate expenditures by functional area or by student category from district or school level data. The data in this study indicate that districts with shifting enrollment also shifted resources, and those shifts have consequences for the allocations made to general and specific functional areas as well as for various populations of students. While collecting this kind of data is a step forward in education finance research, as more robust data is available for analysis and interpretation, the emphasis is still on resource inputs.

Enrollment has become a variable more important than just a denominator in the calculation of cost per student. Increases in enrollment, along with the types of students enrolled, will certainly bring about changes in resource allocations and changes in allocations can bring changes in levels of student achievement. Thus, like other variables, enrollment becomes, if indirectly, a potential catalyst for changes in student achievement and an important area to be researched. How enrollment changes impact resource allocations that in turn impact student achievement is the next iteration in this line of study.

This study provides terrain from which questions on the relationship between enrollment, expenditures and student achievement can be asked. However, enrollment data alone cannot adequately address expenditure or achievement issues unless one splits enrollment into a spectrum that reflects the varying types of students who make up the enrollment. Fewer school districts, especially in Texas, have homogeneous student

populations. With more diverse student populations, both in ethnicity and socio-economic status, school districts are far less likely allocate equivalent dollars per student, as sufficient evidence exists that suggests different types of students require different levels of resources to produce equivalent levels of achievement. Hence, shifting levels of enrollment requires a different analysis for determining how these enrollment shifts affect resource allocations and more importantly how these levels of resources impact the level of achievement (i.e., the outcome) for students.

In addition to changes in enrollment and the types of students who make up that enrollment, other factors within school districts certainly take part in determining expenditures per student, student achievement levels and various other resource allocations. Chapter 6 explores some of these areas and gives rise to the possibility that any of the areas reviewed, with proper research techniques, could be linked to changes in expenditures per student or resource allocations. Enrollment data is but one of many variables that can help explain the resource allocation and achievement dynamics of Texas public schools.

CHAPTER SIX

Other District Characteristics

The purpose of this chapter is to explore other facets of the school districts in this study that, while not explaining the empirical findings detailed in chapter four and discussed in chapter five, offer an understanding of the political, ethnic, and socio-economic climate each district found itself in during the eight years covered in this study.

Local Governance and Initiatives

An elected seven-member board of trustees governs each district in the study. Each school district's members serve four-year terms and represent single member districts. Neither district has board members who serve "at-large", a term describing a member who is elected by all eligible voters in the district and who ostensibly represents the interests of the entire district. While over the eight years both districts saw changes in board members, each district also had board members who served continuously every year in the study. District S had one such member while N had two. These three board members were still serving their respective school districts in the 2006-07 school year.

A perusal of the Comprehensive Annual Financial Reports (CAFR) for each district, the same documents used to gather much of the data used in addressing the research questions, and the districts' Internet websites revealed that both districts developed visions, or strategic plans, throughout the study's time period. While a state requirement mandates that every school district in Texas create a district improvement plan, both districts used that requirement as an opportunity to impart to their respective

communities broad plans for increasing student achievement and creating better district operations.

District S had three separate "Visions" over the period in the study. The first was a vision of being the first urban school district where all students exceeded state and national standards. *Vision 2005*, the second iteration, aimed to improve all district operations while *Vision 2009*, the third and current version, was labeled as "fulfilling the promise". The first two initiatives were initially prominently referenced in the CAFRs but by year three of the study, no mention could be found of the strategic plans in the CAFRs. However, the third vision was promoted and discussed on the district's Internet website. In every case, the district did not address whether it had accomplished the goals it had set for itself.

District N had similar initiatives over the study's period, starting with the adoption of the *Strategic Plan for 1998-2003* in July 1998. The plan had thirteen strategies proffered to the community that would, among other things, reduce the district's dropout rate to zero and ensure all students met or exceeded state standards in several areas. In the 2002-03 school year, having reached the conclusion of the first strategic plan, the district initiated the *Strategic Plan for 2003-2009*. This plan was reduced to eight priorities, and like the first, focused on student achievement. However, unlike every plan for District S and the first strategic plan for District N, measurements of success for the *Strategic Plan for 2003-2009* were provided. These success measurements could be found on the district's Internet website and indicated the district was meeting some of the goals it set for itself.

While adoption of goals and visions is by no means endemic to school districts, it does provide a sense of what the district's leadership sees as the most pressing issues facing their district. While mission statements, strategic plans, and improvement plans are perhaps considered palaver to some, both districts seemed to have used their plans to, after an almost perfunctory decree to raise student achievement, address their own unique needs. For instance, District S, an urban district that incorporates the downtown area of a major Texas city, has aging facilities. Therefore, one of its early goals was to provide appropriate facilities for its students. In fact, in 1997 this district successfully passed a $483 million bond proposition, at that time the largest in Texas history. On the other hand, District N, acknowledging its growth, included in one of its eight priorities a desire to maintain facilities and transportation needs for its growing student population. So while each district trumpeted a desire to raise student achievement, some of the underlying goals and visions included in the improvement plans did provide a sense of the challenges each district faced.

The creation of a vision or strategic plan is usually accomplished by a school board in conjunction with community and staff members. Both Districts S and N noted that their communities and staff were involved in the development of their respective plans. The carrying out of these visions and strategic plans is left to the district's superintendent who, as the only employee hired by a school board, is a key component of not only ensuring the meeting of goals, but setting the tone by which they are carried out and accomplished.

District Leadership

The superintendent is "the educational leader and the chief executive officer of the school district" (Texas School Law Bulletin, 2006) and is therefore responsible for setting the instructional tone as well as maintaining the overall organizational efficiency of the district. Within the school district community, especially in Texas, there is a widely repeated axiom that the average tenure of superintendents is three years. However, a report issued by the Texas Association of School Boards[9] (TASB) in the 2006-07 school year indicated that the average tenure of Texas superintendents is actually four years. While this data was gathered from surveys mailed to school districts, the report indicated that 79% of the state's 1,031 school districts responded to the survey.

Both districts in the study had stable leadership over the eight years reviewed. District S had the same superintendent for seven of the eight years in the study. Only the first year in the study was District S not led by this individual. District N had two superintendents over the course of the study, each leading the District for four years, supporting the findings of TASB. In the 2006-07 school year, District S changed superintendents while District N maintained the same individual who first started in the 2001-02 school year. No data was available to suggest that any of the superintendents who served the districts over the study's time period deviated from the improvement plans in place. There was also no direct evidence that the changes in superintendents

[9] A summary of the report is available online at http://www.tasb.org/services/hr_services/documents/SUPT_HIGHLIGHTS_TEXT1.PDF

were caused by political turmoil, a situation prevalent in Texas school districts. District N's Internet website indicates the superintendent who led the district the first four years of the study retired. Discussions with District S officials indicated the former superintendent left of his own volition to seek other career opportunities. While the focus of the study was enrollment's affect on resource allocation, the vagaries of resource allocations can only partly be explained by changes in enrollment. It would be foolish to not recognize the part a superintendent, or for that matter a school board, plays in changing how resources are allocated. Recognizing this does not invalidate any findings made in chapter four, but rather adds another dimension to explore and explain the how and why of changes in resource allocations.

One aspect school boards may consider when hiring a superintendent is the ethnicity of the individual who will serve the school district. The superintendent who served District S for seven of the eight years was a Hispanic male as was his replacement in the 2006-07 school year. In fact, discussions with district staff indicated that the top three finalists were all Hispanic males. The superintendents for District N were both White males. This is important as each district in the study had a majority minority student population over the eight-year period. In addition, District S also had a majority minority teaching staff in each year of the study. District N's minority teaching staff, while not a majority, increased every year covered by the study.

Student Demographics

In every school year in the study, both districts had a majority minority student population. Both districts also grew in minority population over the eight years in the

study as shown on Table 14 below. Table 14 also indicates that this further "darkening" of the school districts, to borrow a term from pop culture postmodernism, came at the expense of the White student population as that population decreased in both districts, although the African American population in District S did show a slight decrease.

In addition to the ethnic demographics of the districts changing, with District N experiencing a larger change indicative not only of its burgeoning student population but the type of residents moving into the district, the socio-economic status (SES) and English language proficiencies of the students in the districts also changed, again, most notably in District N. Table 15 below illustrates the changes in the number of students classified as economically disadvantaged (ED) and those deemed limited English proficient (LEP).

Of the remaining students in District S in 2004-05, they were poorer than the student population in 1997-98, as defined by the requirements to be eligible for free and reduced meals, and had a slightly higher incidence of being classified as LEP. A LEP classification, determined by the school district after diagnostic tests are administered to the student, means a student will receive bilingual or English as a Second Language (ESL) instructional services. Regarding the increases in ED enrollment for both districts, it is doubtful that regression analysis applied to the relationship between ED students and minority enrollment would disprove a common assumption that a higher minority

Table 14: Ethnicity of Students in Districts S and N, 1997-98 and 2004-05

Ethnicity	1997-98	2004-05	% Change
District S	(N=61,112)	(N=56,580)	
Hispanic	84.2%	87.5%	3.3%
African American	10.4%	8.8%	-1.6%
White	5.1%	3.3%	-1.8%
Asian/Pacific Islander	0.2%	0.2%	-
Native American	0.1%	0.1%	-
Total	100%	100%	-
District N	(N=60,083)	(N=74,013)	
Hispanic	50.8%	60.1%	9.3%
African American	6.8%	7.4%	0.6%
White	40.0%	29.5%	-10.5%
Asian/Pacific Islander	2.2%	2.7%	0.5%
Native American	0.2%	0.3%	0.1%
Total	100%	100%	-

population brings with it higher levels of lower SES, and potentially higher levels of LEP students. While the analysis in chapter four showed for each district the number of ED students, the percentage of ED students in relation to total enrollment, and the relationship between PIC 24 expenditures and student enrollment—finding that each district allocated more resources to these kinds of expenditures irrespective of enrollment changes—no analysis was shown on the ethnicity of students. The data in Table 15 helps explain the increases in PIC 24 expenditures.

Table 15: Economically Disadvantaged and Limited English Proficient Students in Districts S and N, 1997-98 and 2004-05

Student Status	1997-98	2004-05	% Change
District S	(N=61,112)	(N=56,580)	
Economically Disadvantaged	88.6%	92.9%	4.3%
Limited English Proficient	15.8%	16.7%	0.9%
District N	(N=60,083)	(N=74,013)	
Economically Disadvantaged	41.3%	47.9%	6.6%
Limited English Proficient	5.1%	6.3%	1.2%

Generally, PIC 24 expenditures are designed to provide compensatory instructional services to students who are at risk of dropping out of school. While being ED is not defined by the TEA as an early indicator of that happening, being LEP is and, therefore, an increase in PIC 24 expenditures is expected as LEP enrollment increases.

A final note regarding ED enrollment in both districts concerns the percentages compared to all major urban school districts. In the 1997-98 school year, all districts classified by the TEA as major urban had a combined ED enrollment of 65.3% and 70.6% in 2004-05 (TEA, 2007). According to the ED percentages for districts S and N, shown on Table 15, District S had substantially more ED students than major urban districts as a whole in both the first and last year of the study. By comparison, District N has substantially less, 41.3% in 1997-98 and 47.9% in 2004-05, than the combined totals for major urban districts.

While each district showed increases in total minority populations, the impact to District S from a percentage basis is considerably smaller than District N. District S,

already at 94.9% minority student population in 1997-98, increased to 96.6% in 2004-05. On the other hand, District N's minority student population was 60% in 1997-98 reaching 70.5% in 2004-05. Based on comparison of the numbers of minority students in 1997-98 and 2004-05, District N saw that number increase by over 44%. At the same time District N was experiencing a larger minority student population, both districts were also employing more minority teachers.

Teacher Demographics

Being located in a major Texas metropolitan area, it is conceivable that both districts draw from the same pool of qualified teachers. Based on data from the U.S. Census Bureau[10], in 2000 the city in which all or part of the districts are located was majority minority. Yet, as shown on Table 16 below, in 2004-05 District N had a minority teaching staff that was approximately a third of its total teaching staff while District S had almost 66% of its teaching staff classified as minorities. Within the context of these two districts, District N appears to be woefully underrepresented in minority teaching staff in relation to both the student population's ethnicity and the area the district serves. However, based on the state's minority teacher totals, it is in fact District S that is an anomaly with a larger percentage of minority teachers than state totals. District N's minority teacher population is more closely aligned with the state. Table 17 shows these relationships.

[10] Data retrieved March 23, 2007, from http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=16000US4865000

Table 16: Ethnicity of Teaching Staffs for District S and N, 1997-98 and 2004-05

Ethnicity	1997-98	2004-05	% Change
District S	(N=3,797)	(N=3,517)	
Hispanic	41.3%	52.4%	11.3%
African American	14.3%	12.2%	-2.1%
White	43.9%	34.5%	-9.4%
Asian/Pacific Islander	0.4%	0.7%	0.3%
Native American	0.1%	0.3%	0.2%
Total	100%	100%	-
District N	(N=3,866)	(N=4,792)	
Hispanic	22.7%	30.8%	8.1%
African American	2.8%	3.1%	0.3%
White	73.5%	65.2%	-8.3%
Asian/Pacific Islander	0.5%	0.7%	0.2%
Native American	0.5%	0.2%	-0.3%
Total	100%	100%	-

Demographic trends for Districts S and N mirror the larger trends happening in the state of Texas. According to Steve Murdock[11] of the Institute for Socioeconomic Research, the population of Texas will continue to grow through 2040. However, the demographics of the state will change significantly, with estimates showing the Hispanic population increasing faster than all other groups making them, by the year 2040, the dominant group, in terms of numbers, in Texas. However, the data also suggests that

[11] All data from Steve Murdock is taken from a report given at the Education Summit in San Antonio, Texas on February 7, 2007. The report was retrieved on March 23, 2007 at http://txsdc.utsa.edu/download/pdf/presentations/2007_02_07_Education_Summit_SA.pdf

Table 17. Minority Teaching Staff in Districts S, N and Texas 2004-05

Ethnicity	District S (N=3,517)	District N (N=4,792)	Texas (N=294,258)
Hispanic	52.4%	30.8%	19.5%
African American	12.2%	3.1%	8.9%
White	34.5%	65.2%	70.3%
Asian/Pacific Islander	0.7%	0.7%	1.0%
Native American	0.3%	0.2%	0.3%
Total	100%	100%	100%

unless student achievement trends change, that larger Hispanic population, indeed the majority of Texas' population, will also be less educated than their White counterparts. Data from the TEA's 2005-06 state AEIS report[12] indicate that in no state assessment category did Hispanic students outperform White students. The same is true for both Districts S and N. Despite a small White population in District S, a review of that district's 2005-06 AEIS report did not find one testing area where Hispanics outperformed Whites. While minorities overall performed better in District N, perhaps reflecting the higher SES of those students, in no testing area did District N's Hispanic or Black students outperform their White counterparts.

Districts S and N face different challenges. District S must deal with a declining enrollment, lower SES students, and other ills associated with urban school districts. District N must contend with rapid growth of its student population, a changing demographic that brings with it its own educational challenges, and trying to maintain

[12] Retrieved March 23, 2007 at http://www.tea.state.tx.us/perfreport/aeis/2006/state.html

the laudable student achievement levels it has seen in the past. While District N enjoyed a "Recognized" status of student performance from 2000-01 through 2003-04, in 2004-05 the district dropped one category to "Academically Acceptable"; the same status held by District S in every year of the study.

Ultimately, the various political, ethnic and socio-economic factors discussed in this chapter take a secondary role in the interplay between the variables of student achievement, enrollment, and resource allocations. While this study used the latter two variables to determine their relationship to one another, any of the other secondary variables could have replaced enrollment and just as easily been used to explain changes in resource allocations. However, with enrollment, expenditures per student, and student achievement so easy to calculate and measure, policy makers and some researchers are quick to assign de facto relationships between them and forgo the possibility that political, ethnic, or socio-economic factors can help explain resource allocations seen in the kind of districts reviewed in this study. As John Bogle (2004) succinctly noted, "sometimes common sense makes clear what statistics can't prove."

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